ATTACHMENT J.4.42

FEMP NUCLEAR SAFETY RELATED SITE PROCEDURES

[**NOTICE:** This attachment contains Fluor Daniel Fernald site procedures related to Nuclear Safety current as of August 1997. These site procedures have been developed in order to comply with 10 CFR 835. The Contractor shall perform all work activities in accordance with these procedures and any future revisions. The Contractor is responsible for compliance with these procedures where the following terms or definitions are used in the procedures:

- FEMP Personnel and/or Personnel
- Employee(s)
- Management and/or Manager(s)
- Supervision and/or Supervisor(s)
- Source Custodian(s)
- General Employee(s)
- Source User(s)]

CONTROL NUMBER: [illegible]
SITE PROCEDURE RP-0014
REVISION NO. 2

RADIATION SOURCE ACCOUNTABILITY AND CONTROL

Effective Date: 10/15/97

Originator (Subject Expert): Robert E. Burgin — Date: 10/6/97

Checker Concurrence: C.M. Hall — Date: 10-6-97

APPROVED BY: Francis A. Renk — Date: 10-7-97
Francis A. Renk, FAM; Radiological Protection

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Flour Daniel Fernald
P. O. Box 538704
Cincinnati, Ohio 45253-8704

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ISSUE AND REVISION SUMMARY

Revision	Date	Description of Issue or Revision
0	8-11-95	Site procedure written to comply with 10 CFR 835 (and others) requirements and replace R.-0001, SSOP-1092, and EM-CS-009.
1	1/26/96	Added responsibilities for user and operator. Revised 7.3.8, added 7.4.2, clarified use of log sheet, updated Section 9 and Table 1 per WR-151.
2	10/15/97	Procedure update and incorporation of existing interim changes.

1.0 PURPOSE

1.1 The purpose of this procedure is to establish the Fernald Environmental Management Project (FEMP) Radiation Source Accountability and Control Program.

2.0 SCOPE

2.1 This procedure applies to all FDF and DOE employees, subcontractors, and other contractors at the FEMP who order, receive, use, provide services involving a radiation source, and/or store accountable radiation sources.

2.2 This procedure does not address the requirements of inventory and accountability of Special Nuclear Material as such. Plutonium, U-233 and U-235 accountable sealed sources are controlled and inventoried under this procedure and may also be controlled under the requirements of the Material Accountability and Control (MC&A) section of Oversight and Program Integration to meet Special Nuclear Material regulations specified in DOE Order 5633.3b.

3.0 REFERENCES

3.1 ANSI N43.2, "*Radiological Safety for X-Ray Diffraction and Fluorescence Analysis Equipment*"

3.2 ANSI N43.3, "*General Safety Standards for Installations Using Non-medical X-Ray and Sealed Gamma-Ray Sources with Energies Up to 10 MeV*"

3.3 RM-0020, *"[FDF] Site Radiological Control Requirements Manual"*

3.4 RP-0002, "*Response and Notification Requirements Involving the Loss or Theft of Radioactive Material*"

3.5 RP-0010, *"Identification and Movement of Radioactive Material"*

3.6 RP-0007, "*Radiological Posting and Access to Radiological Areas*"

3.7 602-1001, "*Radiological Work Permits*"

3.8 602-1004, "*Radiological Deficiency Reporting*"

3.9 RC-DPT-006, "*Access Controls for High and Very High Radiation Areas*"

3.10 RC-DPT-007, "*Radiological Control Requirements for Radiographic Operations*"

3.11 RC-RDA-009, "*Radiation Surveys*"

3.12 RC-RDA-010, "*Radiological Contamination Surveys*"

3.13 RC-DPT-012, "*Radiological Records Management*"

4.0 RESPONSIBILITIES

4.1 Site Radiation Source Controller (SRSC)

1. Approves/Disapproves Radiation Source Custodians and transfers of custody.

2. Maintains original/master records related to the accountability and control of radiation sources (including radiation-generating devices [RGDs] and accountable sealed radioactive sources).

3. Assists Source Custodians in maintaining inventories of assigned accountable radiation sources and RGDs and ensures that radiation sources under their cognizance are tested as required.

4. Coordinates procurement of all RGDs and sealed radioactive sources, reviews radiological survey reports, and if necessary, directs appropriate actions.

5. Performs semi-annual safety and compliance audits of the Real-Time Radiography Units (RTC) in accordance with Reference 3.2 and documents the results as shown in Attachment H.

4.2 Source Custodian

1. Notifies the SRSC of major changes in the location or use of RGDs and sealed sources, and of missing or leaking sources.

2. Ensures responsibilities are not transferred without SRSC and appropriate manager approval.

3. Ensures tests are performed to verify the integrity of sealed sources and that inventory checks are performed every six months during the months of June and December.

4. Ensures tests of RGDs are conducted as required by Reference 3.1 and 3.2, as applicable.

5. Maintains listings of both storage and use locations for all sources in his/her custody.

6. Maintains records of source activities.

4.3 Manager, MC&A - Receives receipt notification of sources containing uranium, plutonium and thorium. Determines if the source is controlled as Special Nuclear Material.

4.4 Department Manager of Radiation Source

1. Designates the Source Custodian for radiation sources under his or her control.

2. Ensures all requisitions for radiation sources are forwarded to the Site Radiation Source Controller for review.

3. Ensures the required training is provided and/or attended by Source Custodians under his/her supervisor.

4.5 Manager, Radiological Control

1. Ensures all sealed (accountable and exempt) radioactive sources or their associated storage containers are marked and stored in accordance with this procedure.

2. Establishes the Radiation Source Accountability and Control program and provides guidance on control and disposal of sealed radioactive sources and RGDs.

3. Designates the SRSC.

4.6 Radiological Control Technician (RCT)

1. Performs receipt surveys of all incoming radioactive sources.

2. Performs the integrity testing (sealed source leak test) of all sources requiring the test.

3. Implements the requirements of References 3.7, 3.9, and 3.10 as required.

4. Reports radiological deficiencies in accordance with the requirements of Reference 3.8 as required.

5. Performs required radiation surveys on RGDs and documents the results on Attachment G, FS-F-2873.

4.7 Source User

1. Handles sealed sources in accordance with good radiological control practices.

2. Uses sources only for their intended purposes and according to approved operations.

3. Stores sources in proper location when not in use.

4. Notifies custodian and/or Radiological Control immediately if a source is damaged, missing, or lost.

4.8 RGD Operator

1. Performs inspection and operational checks of RGDs and associated safety devices and/or interlocks prior to use and documents the results on Attachment G, FS-F-2873 (x-ray diffraction or fluorescence units only).

2. Operates RGD in accordance with job-specific training and established procedures.

3. Wears required dosimetry when operating RGD.

4. Notifies custodian and/or Radiological Control immediately of any abnormal conditions.

4.9 Personnel, Receiving Incoming Materials and Inspection Area

1. Notifies the SRSC upon receipt of radioactive sources or radiation generating devices.

2. Notifies, via the Nuclear Material Receiving Report, (FS-F-0613) the Manager, MC&A upon receipt of any radioactive source or other material containing uranium, thorium, or plutonium.

3. Allows movement of radioactive sources or radiation generating devices only after approval from the SRSC, incoming survey and leak test (if required).

4.10 Liaison or Coordinator of the Acquisition of Commercial Radiography Services - Coordinates the performance of the radiography (receipt and use of the radiographic device) with the SRSC and project Radiological Control personnel.

5.0 GENERAL

5.1 Personnel using radioactive sources and radiation generating devices shall use a Radiological Work Permit or Technical Work Document, if applicable, in accordance with the requirements of Reference 3.7. The requirements of Reference 3.9 shall be followed when using sources having a 30 cm. exposure rate of 100 mR/h or greater.

5.2 Treat all radioactive sources as potentially contaminated by exercising good contamination control practices when handling.

5.3 Exercise proper care when handling sources with mylar coatings, electroplated sources and liquid/gas sources to prevent damage.

5.4 Handling devices should be used when moving any radioactive source. Sources which have a contact exposure rate of 100 mR/h must be handled only with a handling device such as long-handle forceps or tongs.

5.5 Never touch or smear the active surface of any radioactive source. Electroplated sources should never be leaked checked by wiping the plated surfaces directly.

5.6 The instrumentation used to perform a sealed source leak test shall be capable of detecting 1,000 dpm of removable beta-gamma and/or 20 dpm of removable alpha contamination. These lower values are in addition to the requirements of Driver 8.1 to ensure compliance with posting and control requirement of Reference 3.6.

5.7 During inventory and prior to leak testing, a decay correction should be performed to determine if the leak test is still required. Exempt sources are not required to be leak tested. However, they and their storage container are surveyed for loose contamination to ensure compliance with the requirements of Reference 3.6.

5.8 The use and storage location shall be posted in accordance with the requirements of Reference 3.6. Radiographic operations shall meet the posting and control requirements of Reference 3.10.

5.9 The movement of radioactive sources having a contact exposure rate of 100 mR/h shall be approved prior to movement by the SRSC. Care shall be exercised when moving radioactive sources in the vicinity of Radiation Detection Alarm detectors, Continuous Air Monitors, etc., to prevent spurious alarms.

5.10 Sources and/or their storage containers shall be labeled in accordance with Reference 3.5. Normally, the listed activity on the source label will indicate the current activity. If the listed activity is the assay activity, it should be indicated by writing "ASSAY" on the label adjacent the source activity value. A good practice is to list both the assay activity and date as well as the current activity and decay correction date on the label.

5.11 Radioactive sources and radiation generating devices shall be used for their intended purposes only. Sources, radiation generating devices and their shields or storage mechanisms shall not be altered in any manner.

5.12 Disassembly or modification of RGDs is strictly prohibited without approval from the SRSC.

6.0 PREREQUISITES

6.1 The SRSC shall approve/disapprove all Radiation Source Custodians as documented on an approved "Source Custodian Authorization" form.

6.2 Source Custodians shall be trained according to FDF site-specific Radiation Worker I or II training, the requirements of this procedure, and other training as necessary.

6.3 The SRSC shall be trained according to FDF site-specific Radiation Worker II training and other applicable regulatory requirements. The SRSC shall also be a qualified expert on RGDs in accordance with Reference 3.2.

6.4 In the event of the absence of the SRSC, the Radiological Control Manager shall perform the required approval, control, supervisory and managerial functions of the SRSC.

7.0 PROCEDURE

7.1 Radiography Source Use and Control

1. Radiography shall be performed in accordance with the requirements specified in Reference 3.10.

Requestor of Commercial Radiographic Services

2. When it is determined the services of a commercial radiographic service are necessary, coordinate all aspects of the evolution (such as obtaining the subcontractor, planning the radiographic operation, development of the Radiological Work Permit, assignment of the Source Custodian and obtaining approval from the Radiological Control Manager) with the SRSC.

3. Complete Attachment B, FS-F-2327, Approval for Radiography, Section 1 and submit it to the SRSC for processing and approval.

4. If the radiographic device is to be on site for more than 60 days, complete Attachment C, FS-F-4183, Radiation Source Custodian Authorization, and submit it to the SRSC for processing and approval.

Site Radiation Source Controller

5. Review the forms submitted above. If the forms are completed in an unsatisfactory manner, resolve the issues with the Requestor and correct the form(s).

6. Complete the necessary sections of the submitted forms and submit them to the Radiological Control Manager for approval.

Radiological Control Manager

7. Review and approve the submitted forms. If the forms are completed in an unsatisfactory manner, resolve the issues with the Requestor and the SRSC and correct the forms.

8. Sign the forms for approval.

Site Radiation Source Controller

9. Maintain the originals of the submitted forms. Provide a copy to the Requestor.

NOTE: As stated above in Step 7.1.1, actual radiographic operations are conducted in the field in accordance with Reference 3.10.

7.2 Requisitioning New Radiation Sources

Requestor or Purchaser

1. Notify the SRSC of the need and tentative plan to acquire a source. If the source is of the isotope uranium, thorium or plutonium, notify the Manager, MC&A.

2. Ensure order forms (purchase orders, requisitions and invoices) clearly state whether or not that the material being ordered is an accountable sealed radioactive source. Use Table 1 to determine the accountability status of the source.

Site Radiation Source Controller

3. Determine if the requested source is available on site.

   a. If the source is available, provide the location and the name of the current source custodian to the requestor.

   b. If the source is not available, coordinate with the requestor and proceed with the acquisition of the new source.

7.3 Receiving Requisitioned Radiation Sources

RIMIA Personnel

1. Upon delivery of a radiation source, notify the requestor and the SRSC IMMEDIATELY.

CAUTION

- **DO NOT OPEN THE SOURCE SHIPPING CONTAINER WITHOUT SRSC PERMISSION AND AN RCT PRESENT.**
- **DO NOT HANDLE THE SOURCE SHIPPING CONTAINER IF VISIBLE WETNESS IS OBSERVED ON THE SURFACES**
- **DO NOT ALLOW THE SOURCE TO BE RECEIVED BY THE REQUESTOR OR ANY OTHER INDIVIDUAL UNTIL THE SRSC APPROVES MOVEMENT**
- **DO NOT PLACE ANY CONTAINER OR MATERIAL ON THE SOURCE SHIPPING CONTAINER**

Site Radiation Source Controller

2. Unless already performed and upon notification of the source arrival, notify the cognizant RCT to perform a receipt survey of the source. The RCT shall be notified of the official arrival time of the source.

Radiological Control Technician

3. Perform a receipt survey of the source within 3 hours of receipt at RIMIA during normal working hours or within 3 hours of the start of the next normal work day.

   a. The receipt survey shall consist of radiation and contamination surveys in accordance with Reference 3.11 and 3.12.

   b. The sealed source leak test shall be performed prior to using the source.

4. Post and label the source/container as required by Reference 3.5.

5. Notify the SRSC of the results of the receipt survey and sealed source leak test (if performed) and forward a copy of the completed survey to the SRSC. The results of the leak test must be satisfactory prior to the use of the source.

6. If during the course of the receipt survey and/or sealed source leak test any anomalies are noted such as unexpected exposure rates or contamination, immediately isolate the source and notify the SRSC for further guidance.

RIMIA Personnel

7. Complete a Nuclear Material Receiving Report, FS-F-0613, for the received source and forward a copy to the SRSC and Manager, MC&A.

Site Radiation Source Controller

8. Review the receipt survey, sealed source leak test, and receiving report for accuracy and completeness. Direct appropriate actions based upon the contents of the documents.

9. Log the new source into the Sitewide Source Accountability and Control Database.

Source Custodian

10. Ensure source labels are legible and have the correct, current information.
    a. Identification number
    b. Isotope
    c. Activity and date of activity

7.4 Storage of Radiation Sources

CAUTION

DO NOT USE SOURCES HAVING QUESTIONABLE INTEGRITY OR THAT APPEAR TO BE LEAKING. SOURCE LEAKAGE MAY BE INDICATED BY APPARENT ACTIVITY OR EMISSION RATE NOT EQUALING THE EXPECTED DECAY CORRECTED ACTIVITY OR EMISSION RATE. NOTIFY THE SRSC IMMEDIATELY OF SUSPECT SOURCES.

Site Radiation Source Controller

1. Inspect and approve all radiation source storage locations to ensure the requirements for a source storage area are met.

    a. The area is either isolated from occupied areas or located in a posted Radiological Area or Radioactive Material Area. The source storage location may also be in an approved Radioactive Material Storage Area.

b. The area is free of combustible or flammable material.

c. The area or storage cabinet can be locked to prevent unauthorized access to the source.

d. The area is posted in accordance with Reference 3.6.

e. The storage location is posted with the Custodian's name, work location and telephone number.

f. Liquid sources are stored with sufficient absorbent in case of leakage and are not stored with solid sources.

Source Custodian

2. Ensure source storage locations are maintained to meet the requirement of 7.4.1.a through f. above.

3. Infrequently used sources may be declared "NOT IN USE" by the SRSC and placed in a container approved by the SRSC. Inventory these sources every six months. Sealed source leak tests are not required for sources in storage status.

4. Complete Attachment D, FS-F-4192, Sealed Source Accountability Log when using sources outside their immediate storage area (such as other buildings or off site) and upon return to the storage area.

5. Maintain source accountability logs on file at the source storage location.

7.5 Transporting Radiation Sources

1. Sources shall be transported in accordance with the requirements specified in Reference 3.5.

Source Custodian

2. Notify the SRSC prior to transporting a source to a new storage location or an interim storage location.

3. Notify Radiological Control when transporting a source through the Controlled Area.

4. Sources shall be transported in their storage containers (if provided) through the Controlled Area or to off site locations.

5. Log the source out on the Source Accountability Log when transporting outside the immediate use/storage area.

6. If the source is to be shipped off site, the SRSC shall be notified to ensure all applicable shipping requirements are met in accordance with Radiological Control Requirement 5.6 of Reference 3.3. The Sitewide Source Accountability and Control Database shall be adjusted to document the change in source status.

Site Radiation Source Controller

7. Assist the Source Custodian preparing the source for shipment and obtaining the required authorizations for the shipment.

8. Ensure all applicable requirements for movement or shipment of sources are implemented.

7.6 Source Transfer

Source Custodian (Either Existing or Requesting)

1. When a custodianship or storage location change is necessary, contact the SRSC.

2. Complete Attachment E, FS-F-4185, Radiation Source Transfer Request and forward to the SRSC.

Site Radiation Source Custodian

3. Review the transfer request and sign for approval if complete and the transfer is approved/justified.

4. If the requesting custodian is not a qualified source custodian, complete the necessary requirements to complete the qualification.

5. If the source storage location is to be changed, ensure the requirements of 7.4.1.a through f. are met.

6. Maintain original source transfer requests on file.

7. Update the Source Accountability and Control Database to reflect changes in the custodianship of sources.

Source Custodian

8. Transfer the source custodianship and update all postings and documentation as required.

9. If the source is to be transported, ensure the requirements of step 7.5 are met.

7.7 Specific Control Measures

Source Custodian

1. Notify the SRSC of any major planned changes in the use of a radiation source.

   a. On site transfer to a new storage location.

   b. Modification to a source or its shield/container.

   c. Disposal request or offsite shipment of a source. (Only the SRSC may dispose of radiation sources.)

   d. Procurement or other acquisition of a source.

Source Users

2. Handle and use sources in accordance with good radiological safety practices, job specific requirements and the Radiological Work Permit (if applicable).

3. Use sources only for their intended purposes.

4. Store sources in their approved storage locations.

5. Immediately notify the Source Custodian in the event a source is lost, missing, leaking, or damaged.

Radiation Generating Device Operator

6. Perform inspections and operational checks for RGDs and their interlocks/safety devices prior to use and thereafter at a frequency specified by either the NRC license, manufacturer's recommendations, or work controlling document. Record the inspection results on Attachment G, FS-F-2873 (x-ray diffraction or fluorescence units only).

7. Operate the RDG in accordance with the work controlling document and, in the case of radiography, Reference 3.10.

8. Wear required dosimetric devices in accordance with the requirements specified in the work controlling document or the Radiological Work Permit.

9. Notify the SRSC immediately of any abnormal conditions or indications.

Radiological Control Technician

10. Monitor the use of sealed sources and RDGs in accordance with the requirements of this procedure and procedures referenced herein.

11. Assist and support the SRSC and source custodians when performing leak testing, inventory, movement, shipping and receipt of sealed sources and RGDs.

12. Take appropriate actions in the event of a lost, damaged or missing source as directed by the SRSC and in accordance with appropriate emergency procedures (if applicable).

13. Performs and documents on Attachment G (FS-F-2873) the inspections and radiological surveys in accordance with the requirements specified in Reference 3.1.

7.8 Inventory Frequency and Performance

Source Custodian

1. Conduct a physical inventory of all radiation sources assigned during June and December of each year.

2. Document the physical inventory on Attachment F, FS-F-4184, Radiation Source Inventory.

3. During the inventory, verify all applicable sources are in their proper storage location, the source label is accurate and legible and the storage location is posted correctly.

4. Actions required for lost or missing source shall be in accordance with Reference 3.4.

7.9 Integrity (Leak) Testing

Source Custodian

1. Arrange the performance of the leak tests with a qualified Radiological Control technician if the custodian is not an RCT.

Radiological Control Technician

2. Obtain the following equipment

   a. Smear papers or cotton swabs

   b. Exposure rate instrument (ion chamber preferable)

   c. Radiological Survey Report form

   d. Calibrated counting system appropriate for the type emission and capable of detecting 5 nCi (11,100 dpm).

3. Prior to performing the actual leak test, decay correct the source to determine the exempt status by using the following formula:

$$A = A_o(0.5)^n$$

where: A is the current activity
A_o is the initial (normally assay) activity
n is the number of elapsed half-lived between
the initial activity date and current date in same units as source half-life to two places

$$n = \frac{\textit{elapsed time in same units as source half-life to two places}}{\textit{half-life}}$$

4. If the source activity is below the exempt quantity as specified on Table 1 of this procedure or below 5 nCi, the source is exempt from leak test requirements. Notify the SRSC and Source Custodian if the accountability and/or leak test status of a source change.

5. If the source activity requires a leak test, determine, based upon the source type and associated exposure rate, if the direct method or indirect method of leak testing is to be utilized.

   a. The direct method is performed by smearing the source itself and is used if the source of low specific activity or low Curie content and is a sealed, encapsulated, or covered source. That is to say, the active source surface is not exposed.

   b. The indirect method is performed by removing the source from its holder or shield and smearing the surfaces where the source rests when stored. The indirect method is employed for sources of high specific activity or Curie content, electroplated, bonded, uncovered, or bare alloyed sources. Depleted uranium plate sources and plutonium alpha sources are leaked tested using the indirect method.

6. Label the smears as necessary to correlate the smear to the source.

7. Count the smears using a counter capable of detecting 5 nCi for the emission type and energy associated with the source.

8. If the analysis of the smear samples indicates activity below 5 nCi, document the results in accordance with Reference 3.12. The actual calculated value of the activity shall be recorded vice "<MDA." Indicate negative activity values with an asterisk.

9. If the analysis of the smear samples indicates activity above 5 nCi:

   a. Verify the contamination is of the same radionucide as the source being leak tested. A different emission type or isotope may indicate the source has been cross-contaminated by another leaking source.

   b. Take the necessary steps to control the spread of contamination.

   c. Contain the source and remove it from use.

   d. Survey the storage area of the source to determine the extent of the loose contamination. Post areas in accordance with Reference 3.6.

   e. Notify the SRSC and Source Custodian.

   f. Initiate a Radiological Deficiency Report in accordance with Reference 3.8.

NOTE: Indication of the presence of activity greater the 5 nCi on the smear sample may not always be an indication of a leaking source. The normal oxidation process of metals, the physical characteristic of the element (such as the malleability of uranium metal) and contaminants such as radon daughter deposition on the source or source holder may result in contamination being detected. In addition, contamination may identified and quantified below 5 nCi, but could be above the posting values stated in Reference 3.6.

10. Document the results of the leak test in accordance with the requirements of Reference 3.12.

11. Forward a copy of the reviewed radiological survey documenting the leak test to the SRSC and the Source Custodian.

Site Radiation Source Controller

12. Review the submitted sealed source leak test to ensure all sources that are required to be tested have been surveyed.

13. Direct appropriate actions based upon the results of the leak tests.

14. Ensure the Radiation Source Accountability and Control Database is updated.

7.10 Records

1. The SRSC will maintain the originals of the following source records until project completion:

   a. FS-F-3941, Request for Temporary Use of Radioactive Material and/or Radiation Generating Devices

   b. FS-F-2327, Request for Radiography

   c. FS-F-4183, Radiation Source Custodian Authorization

   d. FS-F-4184, Radiation Source Inventory

   e. FS-F-4185, Radiation Source Transfer Request

   f. Original source certification records if available

   g. Original semi-annual Real-time Radiography Safety and Compliance Assessment Report.

2. Upon completion of the project, source records will be archived in accordance with Reference 3.13.

Source Custodian

3. The Source Custodian will maintain copies of the following records until source retirement and disposition then destroy.

   a. Inventory list of the assigned sources

   b. Sealed source leak tests

   c. Radiation source custodian authorization

   d. Source certification documents

   e. Radiation source inventories

RIMIA Personnel

4. RIMIA personnel will maintain, in accordance with the appropriate requirements, records of Nuclear Material Receiving Reports.

Radiological Control Technicians

5. RCTs will process the following records in accordance with the requirements of Reference 3.13:

   a. Sealed source leak tests

   b. Receipt surveys

   c. Surveys of source storage areas

   d. Investigatory surveys involving radiation sources

   e. X-ray generating device inspection records and surveys

8.0 DRIVERS

8.1 DOE Notice N 441.1, "Radiological Protection for DOE Activities"

8.2 ANSI 43.2, "Radiological Safety for X-Ray Diffraction and Fluorescence Analysis Equipment"

8.3 ANSI 43.3, "General Safety Standards for Installation Using Non-medical X-ray and Sealed Gamma-Ray Sources with Energies Up to 10 MeV"

8.4 10 CFR 835, "Occupational Radiation Protection"

8.5 49 CFR Parts 100-177, "Transportation"

9.0 DEFINITIONS

Accountable Radiation Sources - A collective term for sources of ionizing radiation including radiation-generating devices (RGDs) and accountable sealed radioactive sources.

Accountable Sealed Radioactive Source - A sealed radioactive source (solid or liquid) with a half-life greater than or equal to 30 days and an activity greater than or equal to that listed in Table 1, "Exempt Quantities of RADIONUCLIDES."

Exempted Sealed Radioactive Source - A sealed radioactive source with a half-life less than 30 days, gaseous sources, and sources containing activities less than the values for various RADIONUCLIDES listed in Table 1, and commercially available consumer products containing or comprising sealed sources (e.g., exit signs and smoke detectors). Such sources are exempted from this leak testing and inventory requirements.

Radiation-generating Device (RGD) - A collective term for devices which produce ionizing radiation, small particle accelerators used for single purpose applications which produce ionizing radiation, and electron-generating devices that produce x-rays incidentally. For the purposes of this procedure, RGDs do not include sealed radioactive sources.

Radiation Source - Any source of ionizing radiation (including radioactive material and radiation-generating devices).

Sealed Radioactive Source - Radioactive material that is contained in a sealed capsule, sealed between layers of non-radioactive material, or firmly fixed to a non-radioactive surface by electroplating or other means.

Site Radioactive Source Controller - An individual responsible for maintaining records related to the accountability and control of accountable sealed radioactive sources for a facility, providing each source custodian with an inventory list of accountable sealed radioactive sources assigned to him or her, assisting the source custodian in training source users, and coordinating procurement of all sealed radioactive sources.

Source Custodian - An individual who is responsible for physical control of the sealed source and/or radiation-generating device and for physical inventory of assigned sources.
Source Integrity (Leak) Test - A test performed on all accountable sealed sources to determine if they are leaking and/or contaminated with radioactive material. The test must be capable of detecting the presence of 5 nCi (11,100 dpm) or less of radioactive material on the test sample.

TABLE 1 - EXEMPT QUANTITIES OF RADIONUCLIDES

Less than 300 μCi (1 x 10^7 Bq)							
H-3	Be-7	C-14	S-35	Ca-41	Ca-45	V-49	Mn-53
Fe-55	Ni-59	Ni-63	As-73	Se-79	Rb-87	Tc-99	Pd-107
Cd-113	In-115	Te-123	Cs-135	Ce-141	Gd-152	Tb-157	Tm-171
Ta-180	W-181	W-185	W-188	Re-187	Tl-204		
Less than 30 μCi (1 x 10^6 Bq)							
Cl-36	K-40	Fe-59	Co-57	Se-75	Rb-84	Sr-85	Sr-89
Y-91	Zr-95	Nb-93m	Nb-95	Tc-97m	Ru-103	Ag-105	In-114m
Sn-113	Sn-119m	Sn-121m	Sn-123	Te-123m	Te-125m	Te-127m	Te-129m
I-125	La-137	Ce-139	Pm-143	Pm-145	Pm-147	Sm-145	Sm-151
Eu-149	Eu-155	Gd-151	Gd-153	Dy-159	Tm-170	Yb-169	Lu-173
Lu-174	Lu-174m	Hf-175	Hf-181	Ta-179	Re-184	Te-186m	Ir-192
Pt-193	Au-195	Hg-203	Pb-205	Np-235	Pu-237		
Less than 3μCi (1 x 10^5 Bq)							
Be-10	Na-22	Al-26	Si-32	Sc-46	Ti-44	Mn-54	Fe-60
Co-56	Co-58	Co-60	Zn-65	Ge-68	Rb-83	Y-88	Zr-88
Zr-93	Nb-94	Mo-93	Tc-95m	Tc-97	Tc-98	Ru-106	Rh-101
Rh-102	Rh-102m	Ag-108m	Ag-110m	Cd-109	Sn-126	Sb-124	Sb-125
Te-121m	I-129	Cs-134	Cs-137	Ba-133	Ce-144	Pm-144	Pm-146
Pm-148m	Eu-148	Eu-150	Eu-152	Eu-154	Gd-146	Tb-158	Tb-160
Ho-166m	Lu-176	Lu-177m	Hf-172	Ta-182	Re-184m	Os-185	Os-194
Ir-192m	Ir-194m	Hg-194	Pb-202	Bi-207	Bi-210m	Cm-241	
Less than 0.3 μCi (1 x 10^4 Bq)							
Sr-90	Cd-113m	La-138	Hf-178m	Hf-182	Po-210	Ra-226	Ra-228
Pu-241	Bk-249	Es-254					
Less than 0.03 μCi (1 x 10^3 Bq)							
Sm-146	Sm-147	Pb-210	Np-236	Cm-242	Cf-248	Fm-257	Md-258
Less than 0.003 μCi (1 x 10^2 Bq)							
Gd-148	Th-228	Th-230	U-232	U-233	U-234	U-235	U-236
U-238	Np-237	Pu-236	Pu-238	Pu-239	Pu-240	Pu-242	Pu-244
Am-241	Am-242m	Am-243	Cm-243	Cm-244	Cm-245	Cm-246	Cm-247
Bk-247	Cf-249	Cf-250	Cf-251	Cf-252	Cf-254		
Less than 0.0003 μCi (1 x 10^1 Bq)							
Ac-227	Th-229	Th-232	Pa-231	Cm-248	Cm-250		

These activities were selected to yield a committed effective dose equivalent of 10 mrem (100 μSv) or less for a credible incident to a member of the general public.

ATTACHMENT A - REQUEST FOR TEMPORARY USE (LESS THAN 60 DAYS ON SITE) OF RADIOACTIVE MATERIAL AND/OR RADIATION-GENERATING DEVICES[1]

1. REQUESTING ORGANIZATION (e.g., CONTRACTOR COMPANY):

Name: _____

Address: _____

_____

_____

Contact: _____ Phone: _____

2. RADIOACTIVE MATERIAL AND/OR RADIATION-GENERATING DEVICE INFORMATION

Applicable NRC License/State Registration Numbers **(Please Provide Copy):**

A. Isotope(s)	Activity	B Radiation-Generating Devices (provide applicable manufacturer name, device model numbers, etc.)
1. _____	1. _____	1. _____
2. _____	2. _____	_____
3. _____	3. _____	2. _____
4. _____	4. _____	_____

3. PURPOSE(S):

Use and storage locations: _____

_____

Start Date:[2] _____

Stop date: _____

4. FDF SITE CONTACT: Phone: _____

5.	Cognizant Radiological Control Representative:	Date Reviewed:
6.	Site Source Controller:	Date Reviewed:

APPROVAL	I grant approval for the above contractor to perform the action stated in Block 3 and for the contractor to bring the necessary equipment and resources	RADIOLOGICAL CONTROL MANAGER SIGNATURE	DATE

[1] For other than radiographic devices, which require special approval on Form FS-F-2327.

[2] Radiological Control must be notified when the sources/devices arrive at the FEMP.

FS-F-3941 (06/23/95)

ATTACHMENT B - REQUEST FOR RADIOGRAPHY FERMCO/FEMP

APPROVAL FOR RADIOGRAPHY

SECTION 1

RADIOGRAPHY LOCATION				INTENDED DATE(S) OF RADIOGRAPHY *
RADIOGRAPHY CONTRACTOR				
COMPANY NAME				CONTACT
ADDRESS				PHONE
REQUIRE	ACTIVITY	ISOTOPE	PROJECT ENGINEER OR PRIMARY SITE CONTACT	PHONE
COMMENTS				

SECTION 2

DOCUMENT VERIFICATION

Contractor has a current ( ) NRC or ( ) Agreement State (____) License. COPY ATTACHED. *License No.* **(Amend. # ; Expires:**	*I have reviewed all applicable documents (addressed at left) and have found them adequate to meet FDF requirements for the performance of radiography at the FEMP.*	
Contractor has current emergency procedures available.		
Contractor has current operational procedures available.		
Contractor has been informed of need for continuous radiological controls coverage and or Radiological Work Permit to perform radiography.	*RC Signature*	*Date*

SECTION 3

COMPLIANCE CERTIFICATION	*The above contractor, based on information provided and reviewed, meets the requirements to perform radiography and to bring the necessary equipment and source(s) on site.*	SITE RADIATION SOURCE CONTROLLER SIGNATURE	DATE

APPROVAL

	RC MANAGER SIGNATURE	DATE
I grant approval for the above contractor to perform industrial radiography and for the contractor to bring the necessary equipment and source(s) on site during the time period referenced above.		

* **Must notify Site Source Controller (Extension 648-4318) each time the source is brought to the FEMP.**

ATTACHMENT C - SOURCE CUSTODIAN AUTHORIZATION

FEMP

RADIATION SOURCE CUSTODIAN AUTHORIZATION

SOURCE CUSTODIAN INFORMATION

NAME:	BADGE NO.	SIGNATURE:
DEPARTMENT/SECTION:		SUPERVISOR:

Authorization is requested for the above-named individual to serve as a Source Custodian for the following **TYPE(S)** of radiation source(s)*:

☐ Accountable Radioactive Sealed Source(s) for _____
(e.g., instrument checks, radiography, research)

☐ Radiation-generating Device(s) for _____
(e.g., industrial radiography, medical x-ray)

☐ Combination Device(s) for _____
(e.g., x-ray fluorescence analyses/portable XRF units)

QUALIFICATIONS

Requirement	Yes	No	Comments
1. Rad Worker I or II Trained?			
2. Trained on the requirements of the FDF "Radiation Source Accountability and Control" program?			
3. Trained for specific use?			
4. Proficiency verified?** By whom?:			
Verifiers Initials:			
5. Rad Con Department Manager (or designee) signature:			

AUTHORIZATION

The above-named individual meets all applicable requirements to serve as an FDF "Source Custodian" for the radiation source(s) noted above and is so authorized.

Site Radiation Source Controller (SRSC) Signature:	Date:

* Specific authorized radiation sources are listed in the Radiation Source Accountability and Control Inventory Database maintained by Radiological Control of the Oversight and Program Integration Control Division.

** Section 4 applies to persons approved as Source Custodians after August 1995. Persons approved as Source Custodians prior to August 1995 are "grandfathered."

ATTACHMENT D - SEALED SOURCE ACCOUNTABILITY LOG

SEALED SOURCE ACCOUNTABILITY LOG

This log is intended for use with radiation sources that are typically stored and removed from storage intermittently (e.g., sealed sources used to check instrument operations or XRF devices used at various facilities for short periods). This log should remain at the designated storage location.

Source or Device Serial/I.D. No.:			
DATE & TIME		Purpose/Use/Location	INITIALS OF USER
OUT	IN		

ATTACHMENT E - RADIATION SOURCE TRANSFER REQUEST

RADIATION SOURCE TRANSFER REQUEST

A. TRANSFER FROM:

NAME: _____

SIGNATURE: _____ **Date:** _____

B. TRANSFER TO:

NAME: _____

SIGNATURE: _____ **Date:** _____

C. RADIATION SOURCE TYPE:

- ☐ ACCOUNTABLE RADIOACTIVE SEALED SOURCE
- ☐ RADIATION-GENERATING DEVICE
- ☐ COMBINATION DEVICE

D. DESCRIPTION(S)

1. Isotope(s)/Device(s):
2. Serial Number(s):
3. Proposed use(s):
4. Proposed Use location(s):
   (e.g., Building/Room number)
5. Proposed Storage location:
   (e.g., Building/Room number)

E. APPROVAL (Transfer authorized/approved effective): _____ (DATE)

SITE SOURCE CUSTODIAN:
(Signature) _____

F. DATABASE UPDATED (UPDATE effective): _____ (DATE)

DATA ENTRY MADE BY:
(Signature) _____

REMINDER: ALL SEALED SOURCES ARE TO BE INTEGRITY/LEAK TESTED IN JUNE AND DECEMBER.

ATTACHMENT F - RADIATION SOURCE INVENTORY

Inventory Period _____

RADIATION SOURCE INVENTORY

This FORM is intended to be submitted every JUNE and DECEMBER and, as applicable, should accompany integrity/leak test records.

Instructions:

Please check the list of radiation sources assigned to you (SRSC will provide you with copy prior to JUNE and DECEMBER of each year), complete the certification below, and attach a signed copy of the inventory that was provided to you.

The inventory process requires that you verify through physical means that the radiation sources assigned to you are actually where the inventory states they are. This means that we must be able to state that we saw or measured the radiation from these sources, and that applicable requirements (e.g., the adequacy of posting, labeling, storage locations, containers, devices, and security) have been met.

DO NOT SIGN THIS FORM based on an assumption that the sources are where they "should be" or where you last saw them. Notify the SRSC of any problems/discrepancies.

*** INVENTORY CERTIFICATION ***

I certify that the radiation sources assigned to me (and as listed on the attached list from the Master Radiation Source Accountability and Control Database) were physically inventoried, and that all _____ sources are in the locations as stated on the attached (signed) list.
(# of sources)

I have further verified the adequacy of posting, labeling, storage locations, containers, devices, and security associated with my assigned sources.

Print/Type Name	Signature	Date of Inventory

SURVEY #_____ Page ___ Of ___

ATTACHMENT G - FEMP
ENCLOSED BEAM X-RAY DIFFRACTION AND FLUORESCENCE ANALYSIS EQUIPMENT SURVEY FORM

Surveyor(s): _____ Date:_____

Type of Device:_____ Manufacturer: _____

Model: _____ Serial #: _____ Location: _____

Person(s) Interviewed: _____

Reason for Survey:

- ☐ Initial Installation of Unit
- ☐ Reassembly of Unit
- ☐ Installation of Nonstandard Accessory
- ☐ Routine Periodic Survey
- ☐ Other (specify) _____

Instrument used for Radiation Measurements:

Type:_____ Manufacturer:_____ Model:_____

Serial #:_____ Calibration Date:_____

Comments: _____

_____

I. Administrative (RCT and Operator or Installer)

Yes	No		
☐	☐	1.	No changes are required in the authorized user list on the Information Sheet.
		1.1	Add _____
		1.2	Delete _____
☐	☐	2.	Written procedures for normal operations are available to operator.
☐	☐	3.	If the device has more than one irradiation port, procedures require unused ports to be secured against accidental opening.
☐	☐	4.	Written procedures for alignment are available to the operator.

Comments: _____

_____

ATTACHMENT G (cont.) ENCLOSED BEAM X-RAY DIFFRACTION AND FLUORESCENCE ANALYSIS EQUIPMENT SURVEY FORM

Survey # _____ Page ___ Of ___

II. Protective Features (RCT and Operator or Installer)

Yes	No		
☐	☐	1.	The control panel is labeled with the radiation symbol and the words, "Caution: This Equipment Produces X-Rays when Energized - To be used only by Qualified Personnel, " or an appropriate similar message.
			Message: _____
☐	☐	2.	If the device has more than one irradiation port, shutters at unused ports are secured against accidental opening.
☐	☐	3.	The warning light (or device) near the activating switch functions properly.
☐	☐	4.	The warning light (or device) on the source housing functions properly.
☐	☐	5.	The warning device near the activating switch is fail-safe.

III. Radiation Measurements (RCT or SRSC)

Background Meter Reading: _____

Exposure Correction Factor: _____

Sketch of Device

LOCATION	OPERATOR'S HANDS	OPERATOR'S TORSO	BEYOND THE BEAM STOP	ACCESSORY APPARATUS	1	2	3	4	5	6
METER READING										
CORRESPONDING DOSE RATE										

IV. Operation

Maximum hours of operation per week _____

Maximum operating voltage (kVp) _____ and current (mA) _____ across the tube.

RGD Operator or Installer Signature _____ Date: _____

RCT Signature _____ Date: _____

CC:SRSC

ATTACHMENT H **PAGE 1 of 2**

EXAMPLE OF SEMI-ANNUAL RTR ASSESSMENT REPORT

COVER PAGE

SEMI-ANNUAL RADIOLOGICAL SAFETY AND COMPLIANCE ASSESSMENT

(NAME OR BRAND OF DEVICE BEING INSPECTED)

OFFICIAL DESIGNATOR OF UNIT
LOCATION OF UNIT

DATE OF THE ASSESSMENT

ASSESSOR/REPORT GENERATOR SIGNATURE, TITLE	**REVIEWER/APPROVER OF THE REPORT SIGNATURE, TITLE**
DATE REPORT SIGNED	**DATE REPORT APPROVED**

ATTACHMENT H (cont.)
EXAMPLE OF TABLE OF CONTENTS OF
SEMI-ANNUAL RTR ASSESSMENT REPORT

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SECTION 3. EQUIPMENT.....

A. X-RAY SYSTEM.....
B. RADIATION PROTECTION ENCLOSURE..
C. WARNING AND ALARM SYSTEMS.....
D. OTHER SAFETY FEATURES.....

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B. RADIATION MEASUREMENTS..... .....
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E. DESIGN CRITERIA..... .....
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SECTION 6. DISCLAIMER.....

SECTION 7. ATTACHMENTS.....

RADIOLOGICAL SURVEYS.....

UNREVIEWED SAFETY QUESTION (USQ) DETERMINATION AND SAFETY EVALUATION SYSTEM

NS-0002
REV. 3

Effective Date: 10/20/97

Originator (Subject Expert): Victoria E Werner 10/07/97
Victoria Werner, System Safety Staff — Date

Checker Concurrence: James W. Smith 10/7/97
James W. Smith, Manager, Safety Analysis Department — Date

Authorized By: Francis A. Renk 10-17-97
Francis A. Renk , Nuclear and System Safety FAM — Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Fernald Environmental Restoration Management Corporation
P. O. Box 538704
Cincinnati, Ohio 45253-8704

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Appendix B: Representation of Form FS-F-4041, USQD/SE SUMMARY & EVALUATION FORM 31

ISSUE AND REVISION SUMMARY

Revision	Date	Description of Issue or Revision
0	02-01-94	New document describing the USQ System per Request No. S93-220, initiated by R. Kline.
1	04/10/96	Procedure was reformatted and renumbered in accordance with Site Procedure MS-1001, Rev. 0. Changes include adding reference to Basis for Interim Operations (BIOs), changing ISRC review to only those that indicate a USQ; extensive editorial changes (grammar and spelling); and updating the process flow diagrams. Initiated by VE Werner to respond to Lessons Learned and 2-yr review cycle. Due to extensive amount of changes, re-review like a new procedure; no change bars indicated. Performed by V. Werner.
2	08/01/96	Delete Pre-Screen (FS-F-4039) and all reference to the Pre-Screen process. Move the Exclusion process to the USQ Screen. Revise USQ Screen form (FS-F-4040) to include exclusion and additional adjacent facility/activity question. Add definitions and make editorial/format changes. Performed by V. Werner
3	10/20/97	Administrative changes only, organizational titles, deletion of Attachment B to be issued as a separate department-level procedure, incorporation of temporary change notices, incorporation of reference to NS-0008, *Safety Basis Document Review (SBDR) process,* and minor editorial changes for clarification.

1.0 PURPOSE

The purpose of this document is to set forth the FEMP system for determining the existence of an Unreviewed Safety Question (USQ) and evaluating its impact on the DOE-approved safety basis. This document describes the responsibilities, procedures and the implementation requirements which govern the need for, and the performance of, safety evaluations at the FEMP in compliance with the provisions and intent of DOE Order 5480.21.

2.0 SCOPE

2.1 The FEMP Unreviewed Safety Question Determination and Safety Evaluation (USQD/SE) System applies to those facilities and activities that have DOE-approved safety basis documentation. Issues related to FDF-approved safety documents are routed through the safety basis document review (SBDR) process, NS-0008.

2.2 This system is applicable to all technical aspects of the FEMP organizations responsible for the design, engineering, maintenance, construction, inspection, operations, and assessment of nuclear facilities and activities at or affected by the FEMP.

2.3 The types of changes that this document applies to are as follows:

2.3.1 All proposed nuclear facility or activity modifications.

2.3.2 All proposed changes to engineering procedures; Plant Test Authorizations (PTAs) or Test Authorizations (TAs); sitewide and operating procedures; and requirement and other manuals which have requirements and/or procedures that could directly or indirectly impact the assumptions used to bound activities in any FEMP DOE-approved safety basis document.

2.3.3 All proposed changes to projects/activities which could directly or indirectly impact the assumptions used to bound activities in any FEMP DOE-approved safety basis documents.

2.3.4 Any proposed change to a Project-Specific Health and Safety (PS/H&S) Plan or similar document explicitly referenced by any FEMP DOE-approved safety basis document.

2.3.5 A discovered potential inadequacy in any FEMP DOE-approved safety basis document, potential reduction in any Technical Safety Requirement (TSR) margin of safety, or an unauthorized change to a facility or activity addressed in a FEMP DOE-approved safety document.

2.4 Use of this procedure for documenting the evaluation and review of changes impacting FEMP FDF-approved safety basis documentation is not restricted, but the use of NS-0008, *Safety Basis Document Review (SBDR) Process*, is the preferred

method. The documentation and review of such changes is a line management requirement of the Safety Analysis Program, RM-2116.

3.0 REFERENCES

3.1 DOE Order 5480.21, UNREVIEWED SAFETY QUESTIONS

3.2 DOE Order 5480.20A, PERSONNEL SELECTION, QUALIFICATION, TRAINING, AND STAFFING REQUIREMENTS AT DOE REACTOR AND NON-REACTOR NUCLEAR FACILITIES

3.3 RM-2116, *System Safety Requirements*

3.4 PL-3049, *Implementation Plan for Safety Analysis Reports and Technical Safety Requirements at the Fernald Environmental Management Project*, effective date 01/08/96.

3.5 NS-0003, *Safety Assessment Hazard Screening and Classification*

3.6 CM-0001, *Configuration Management*

3.6 ED-12-1003, *Engineering Design Glossary*

4.0 RESPONSIBILITIES

4.1 President of FDF

4.1.1 Reviews and approves/denies all USQD/SEs that demonstrate the existence of a USQ, and all proposed changes to DOE-approved TSRs and/or Operational Safety Requirements (OSRs) received from the Independent Safety Review Committee (ISRC). Returns denied packages to the Coach of Safety Analysis (SA) for action.

4.1.2 Submits to DOE-FEMP for their review and concurrence completed and approved USQD/SEs that indicate the existence of a USQ, and all approved, proposed changes to DOE-approved TSRs/OSRs.

4.1.3 Notifies DOE-FEMP upon discovery of any potential inadequacy of any DOE-approved safety analyses documentation, potential reduction in any TSR margin of safety, or an unauthorized change in a facility or activity which is addressed in DOE-approved safety documentation.

4.2 Safety Analyses (SA) Team Coach

4.2.1 Concurrently notifies the President of FDF, the NS Functional Area Manager, and the Line Management who has responsibility for the facility/activity(ies) which could be adversely impacted, upon discovery of any potential inadequacy of DOE-approved safety analyses documentation, potential

reduction in any TSR margin of safety, or an unauthorized change in a facility or activity which is addressed in DOE-approved safety documentation.

4.2.2 Controls and issues USQD/SE System Log numbers, and maintains the applicable tracking system(s) for these logs.

4.2.3 Assigns Qualified Safety Evaluators (QSEs) to perform USQD/SEs. Normally, these QSEs are members of the Safety Analysis Department Staff or are support personnel such as Teaming Partners or subcontractors working for the Safety Analysis Department.

4.2.4 Reviews and approves all USQ Screens, except for those which document an exclusion from the System. In the event of a disagreement concerning a USQ Screen determination, makes the final determination in accordance with the requirements of the USQD/SE System.

4.2.5 Reviews and concurs with all completed USQD/SEs.

4.2.6 Ensures that all completed USQD/SEs which determine that no USQ exists are properly distributed, filed and maintained as auditable records.

4.2.7 Ensures that completed USQD/SEs have additional evaluation or analysis as needed and submits those which indicate a USQ exists for ISRC review and recommendation.

4.3 **Independent Safety Review Committee (ISRC)**

Reviews and recommends to the President of FDF to approve or deny those USQD/SEs and proposed changes to DOE-approved safety documentation, including TSRs/OSRs transmitted to them in accordance with the requirements of this procedure.

4.4 **Qualified Safety Evaluator (QSE)**

4.4.1 Performs all USQD/SEs in accordance with the requirements of this procedure.

4.4.2 Notifies the SA Team Coach when information or a situation has been identified that indicates a potential inadequacy of previous DOE-approved safety documentation, a potential reduction in the margin of safety as defined in any DOE-approved TSRs/OSRs, or an unauthorized change to a facility or activity addressed in a DOE-approved safety document.

4.4.3 Provides guidance for Technically Responsible individuals (TRs) in the preparation of USQ Screens.

4.4.4 Reviews all assigned USQ Screens, indicating any corrections/additions to be made by the TR, and concurring with the determination as stated on the USQ Screen form, FS-F-4040.

4.4.5 Performs USQ Screens when necessary, as a TR, with another QSE performing the QSE functions.

4.4.6 Submits reviewed USQ Screens, which indicate other than an exclusion to the USQD/SE System, and USQD/SEs to the SA Team Coach for review and approval.

4.4.7 Submits all completed USQ Screens and USQD/SEs which do not indicate a USQ exists to the applicable individual in the SA Team so that they can be properly distributed and filed as readily auditable records.

4.5 **Technically Responsible Individual (TR) Having Technical Responsibility for the Issue**

4.5.1 Obtain and maintain a working knowledge of the current safety basis documentation applicable in their area of responsibility, with a special emphasis on the safety basis requirements.

4.5.2 Performs the USQ Screen in accordance with the requirements of this procedure.

4.5.3 Resolves QSE and any other reviewer comments on the USQ Screen and makes corrections.

4.5.4 Provides accurate information and data to assist the QSE in the performance of a USQD/SE and any additional safety evaluation/analysis necessary. Supplies any additional information that may be related to the issue's impact on safety.

4.5.5 Notifies the SA Team Coach when information or a situation has been identified that indicates a potential inadequacy of previous DOE-approved safety documentation, a potential reduction in the margin of safety as defined in any DOE-approved TSRs/OSRs, or an unauthorized change to a facility or activity addressed in a DOE-approved safety document.

4.6 **Line Management of Organizations Responsible for Safety-Related Activities and/or Can Initiate Changes to Nuclear Facility/Activity (including training and procedures)**

4.6.1 Ensure that the requirements of the USQD/SE System as defined in RM-2116 and this procedure are implemented in his/her organization.

4.6.2 Ensure that the Technical Review Board is notified of all USQD/SE System cleared/approved changes as documented in USQD Screens and USQD/SEs.

4.6.3 Ensure that sufficient TRs are trained and assigned in his/her area of responsibility to adequately assess the flow of work for proposed changes or discovered potential inadequacies of DOE-approved safety documentation, potential reductions in any TSR margin of safety, and any unauthorized

changes to facilities or activities as addressed in any applicable DOE-approved safety documentation.

4.6.4 Notifies the SA Team Coach when information or a situation has been identified that indicates a potential inadequacy of previous DOE-approved safety documentation, a potential reduction in the margin of safety as defined in any DOE-approved TSRs/OSRs, or an unauthorized change to a facility or activity addressed in a DOE-approved safety document.

5.0 GENERAL

NOTE: Refer to RM-2116 for USQD/SE System Requirements and system process flow diagrams.

5.1 Authorization Basis

5.1.1 The authorization basis is defined as "those aspects of the facility basis and operational requirements relied upon by DOE to authorize operation." The FEMP authorization basis includes the following types of DOE-approved safety documents:

- Safety Analysis Reports (SARs),
- Hazard Analysis Reports (HARs),
- Basis for Interim Operations (BIOs),
- Safety Evaluation Reports (SERs),
- Technical Safety Requirements (TSRs),
- Operational Safety Requirements (OSRs), and
- Other DOE-approved safety documentation, such as Auditable Safety Records (ASRs) or Safety Assessments.

5.1.2 Changes to a nuclear facility or activity include proposed changes to the facility configuration; changes to facility/activity procedures; changes to other policies and procedures that could affect facility operation or, in the FEMP case, demolition/remediation activities; and experiments or tests not described in the facility's or activities' authorization basis. In addition to proposed changes to a facility, the USQD/SE System is used to evaluate discovered existing conditions. If it is found that some attribute of the facility or activity differs from that described in the authorization basis, (such as a potential inadequacy in any DOE-approved safety document, a potential reduction in any TSR margin of safety, or an unauthorized change to a facility/activity addressed in a DOE-approved safety document), then the USQD/SE System is used to determine if this as-found condition could have resulted in the facility or activity being outside its authorization basis. Collectively in the FEMP USQD/SE System, these proposed changes and as-found conditions are called "issues."

5.1.3 Except for as-found conditions, the USQD/SE System is applied before the change is implemented. For physical changes to a facility, the USQD/SE

System application is completed before the start of construction. For changes to procedures, the USQD/SE System application is completed before the procedure is approved for use.

5.2 Requirements

NOTE: The requirements listed here are in addition, and subordinate, to the USQD/SE System Requirements listed in RM-2116, and are intended to implement the system as described in RM-2116.

5.2.1 During the originating department's technical review, if it is found that no formal safety analysis exists or that which exists does not reflect actual conditions or the proposed change; the Safety Analysis Team is to be requested to perform a new, or to revise an existing, safety analysis per the requirements of RM-2116 as implemented in NS-0003.

5.2.2 Regardless of when or how information is obtained which shows a potential inadequacy may exist in previously DOE-approved safety analyses documentation, a possible reduction in the margin of safety as defined in the TSRs, or an unauthorized change to a facility/activity which has applicable DOE-approved safety analyses documentation, that information shall be transmitted to the Coach of Safety Analysis who shall then concurrently inform the President of FDF, the NS Functional Area Manager, and the Line Management who has responsibility for the facility/activity(ies) which could be adversely impacted.

5.2.3 A known change to a DOE-approved TSR/OSR automatically requires DOE approval, as required by DOE Order 5480.21. The ISRC and the President of FDF review these proposed changes to determine if the change will be allowed, their support, concurrence, and/or approval of the proposed change. They may determine that the TSR will not be changed and the project/activity will have to comply with the TSR as currently written.

5.2.4 USQD/SE System Log numbers shall be controlled and issued by the SA Team.

5.2.5 USQD/SE System documentation shall be either manual on hard copy forms, or a signed and dated hard copy of authorized computer-generated forms. Representations of the forms included in this procedure are not exact duplicates of the actual forms as they have been slightly altered to fit into this procedure and are included only for information. These representations are not to be used for the actual performance of any portion of the USQD/SE System. The controlled approved forms, FS-F-4040 and FS-F-4041, (either hard copy or electronic) are to be used in the actual performance of USQD/SE System process.

5.2.6 USQD/SE System documentation shall provide a sufficient level of detail for a TR/QSE to reach an informed determination, and for the reviewing

and approving management personnel, including the ISRC, to be able to reach the same conclusion.

5.2.7 All activities performed under the FEMP USQD/SE System procedures shall be documented on the USQD/SE System forms per this document.

5.2.8 A list of all references relied upon to reach a USQ Screen and a USQD/SE conclusion shall be included in the documentation, either in the space provided on the form or on attached continuation sheets.

5.2.9 All approved USQ Screens, USQD/SEs, and their supporting documentation which is required to be submitted as part of a USQD/SE package shall be maintained, retained and controlled as auditable records by the Safety Analysis Team.

5.2.10 Each USQ Screen and USQD/SE shall be identified by an administratively controlled number (USQD-YR-0000). This number shall consist of the following parts:

a. Document Identifier (USQD);

b. A two-digit year of performance indicator (94, 95, 96, etc.); and

c. A unique four-digit number indicating the sequence in which the number was issued in a given year (0001 to 9999).

5.2.11 If a QSE performs the function(s) of a TR (i.e.,preparation of a USQ Screen) for a given issue, the same QSE shall not then perform the QSE function(s) for the same issue (e.g., review and concur with the USQ Screen or conduct the USQD safety evaluation).

6.0 PREREQUISITES

Prior to the performance of this procedure, formal training shall be successfully completed and documented in the FEMP official Training Records in the requirements and appropriate use of the FEMP USQD/SE System. Selection criteria and training requirements for Qualified Safety Evaluators, Technically Responsible (TR) individuals, and USQD/SE Reviewers (ISRC) are described in RM-2116.

7.0 PROCEDURE

7.1 Immediate Response to Discovery of Potential Inadequacy in DOE-Approved Safety Analyses Documentation, Potential Reduction of TSR Margin of Safety, or Unauthorized Change to a Facility/Activity Addressed in DOE-Approved Safety Documentation

A USQD/SE is required for any instance where discovery of an analytic error, omission, or inadequacy in previously DOE-approved safety documentation presents

the potential for an Unreviewed Safety Question. Such analytic errors, omissions, or inadequacies must have the potential for impacting the authorization basis, thereby calling into question information explicitly or implicitly relied upon in the facility safety analyses documentation or by reducing the margins of safety as defined in the TSRs. The intent here is to ensure that the operations are conducted in a safe manner that is consistent with the authorization basis.

Because an analytical error, omission, or inadequacy as specified above has the potential for calling into question information relied upon for authorization of operations, DOE requires the following:

TR, QSE, Line Management Staff, or Other Knowledgeable Individual(s)/Group(s)

7.1.1 **IF** the answer to any of the following questions is **YES, THEN** notify the Coach of Safety Analysis (SA) immediately:

A. Has a change been made to a facility or activity that has a DOE-approved safety document, BUT that change was neither described in the DOE-approved safety document(s) nor was it previously evaluated to determine its potential impact on the safety of the facility or activity?

B. Has information reported/described in a DOE-approved safety document been found to be inaccurate or incomplete?

C. Has information concerning a facility/activity been omitted from a DOE-approved safety analysis that could potentially alter or adversely impact the authorization basis, i.e., the DOE-approved safety documentation, for that facility or activity?

TR, QSE, Line Management Staff, or Other Knowledgeable Individual(s)/Group(s)

D. Was the design basis of a nuclear facility changed to make it agree with the as-built condition?

E. Does observation of the actual nuclear facility configuration differ from the one described in that facility's DOE-approved safety documentation?

7.1.2 **IF** the situation warrants, **THEN** implement the applicable emergency response measures and/or the occurrence reporting procedure.

SA Team Coach

7.1.3 Upon receipt of information described in 7.1.1, verify the information received and, immediately and concurrently, notify the President of FDF, the NS Functional Area Manager, and the Line Management who has responsibility for the facility/activity(ies) that could be adversely impacted.

7.1.4 Initiate USQD/SE process for this issue. **GO TO** Step 7.5.

President of FDF

7.1.5 Upon receiving information of discovery of a potential inadequacy of any DOE-approved safety analysis, a potential reduction in any TSR margin of safety or any unauthorized change in a facility or activity addressed in DOE-approved safety documentation, notify DOE-FEMP.

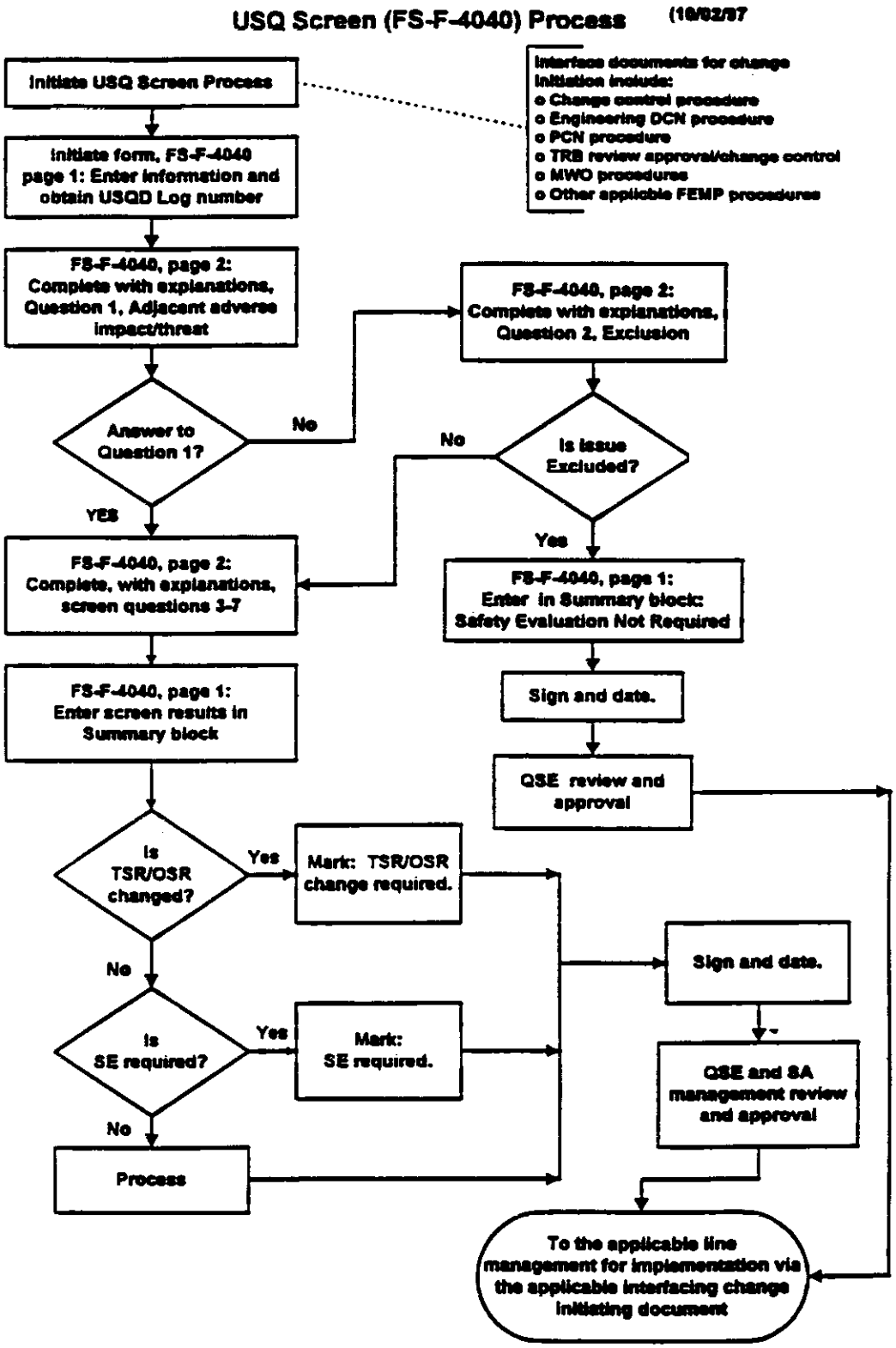
Line Management Responsible for Impacted Facility/Activity

7.1.6 Upon receiving information as described in 7.1.3, take action to place the facility in a safe condition until the safety evaluation is completed and concurrence/approval is obtained from DOE via the President of FDF. DO NOT REMOVE ANY OPERATIONAL RESTRICTIONS INITIATED PURSUANT TO THIS ISSUE WITHOUT APPROVAL/CONCURRENCE OF THE PRESIDENT OF FDF AND THE Safety Analysis (SA) Team Coach.

Line Management Responsible for Impacted Facility/Activity and Manager of NS Functional Area

7.1.7 Supply information and support for the timely and accurate completion of the USQD/SE.

Figure 1: FEMP USQ Screen Process



S

Figure 2: Representation of Form 4040 (10/20/97)

FEMP USQ SCREEN

USQD-YR-0000

(Obtain USQD/SE Log Number from the Safety Analysis Department.)

ISSUE TITLE (Enter brief title identifying issue or issue being evaluated.):

A

FACILITY AND LOCATION (Enter building or facility, including the number, where issue exists or issue will be.):

AUTHORIZATION BASIS DOCUMENTS & REFERENCE DOCUMENTS (Enter the DOE-approved safety documentation such as SAR/HAR/BIO/SER/OSR/TSR. Identify additional reference documents. If NO DOE-approved safety documentation exists that addresses the issue, activity or facility, go to NS-0003 to initiate a safety assessment):

M

BRIEF DESCRIPTION OF ISSUE (Obtain and present a brief description of the issue to be evaluated. Attach and reference here a copy of the issue package such as a proposed work plan.):

P

USQ SCREEN RESULTS SUMMARY

NOTE: If the answers to the questions posed on page 2 of this form are all NO, a USQD/Safety Evaluation is not required; a potential USQ does not exist. A YES answer to any of the questions 1, 3-7 shall require a safety evaluation. If question 1 is answered NO, and question 2 is answered YES, the issue is excluded from further screening and a safety evaluation is NOT required.

L

☐ TSR/OSR change required. (Perform a USQD/SE and obtain DOE Approval)

☐ Safety Evaluation Required. (Question 2 is NO *and* at least one question 1, 3-7 is YES)

E

☐ Safety Evaluation Not Required. (Item 1 is NO *and* item 2 is answered YES, *or* all are NO)

SIGNATURES: (Print name/signature) DATE

Technically Responsible Individual

Qualified Safety Evaluator

Coach, Safety Analysis Team

S

Figure 2 (cont): Representation of Form 4040 (10/20/97)

USQ SCREEN (cont) USQD-YR-0000

USQ SCREEN TO PREVENT UNNECESSARY SAFETY EVALUATIONS: (Use NS-0002 to aid determination of responses.)

A

1. Does this issue change, or add to, the descriptions/discussions of nearby or adjacent facilities/activities in any DOE-approved safety documentation? (in SAR sections "Nearby Facility" or "External, Man-Made Threat" OR SID section "Safety Analysis")

☐ YES ☐ NO Explain: (Include the number and title of the document being impacted.)

M

If YES is the answer to item 1, skip item 2 (the issue cannot be excluded) and continue the screen.

2. IF the answer to item 1 is NO, THEN is this issue Excluded from the USQD/SE System? (GO to NS-0002, Attachment A):

☐ YES ☐ NO IF YES, the exclusion is:

P

If question 1 is answered NO, and question 2 is answered YES, then the issue is excluded from further screening and a safety evaluation is NOT required. Refer to NS-0002, Section 7.4, for instructions for completing the Results Summary and Signatures blocks. If question 2 is answered NO, continue the screen.

3. Does the issue involve changes to the facility description, including equipment, operations/activities, and building contents, in the applicable DOE-approved safety documentation?

☐ YES ☐ NO Explain:

L

4. Does the issue involve significant changes to the procedures described in the applicable DOE-approved safety documentation? (As a reminder, inconsequential changes such as [illegible] typographical corrections, grammatical changes, clarifications, or note references, are not considered significant changes.)

☐ YES ☐ NO Explain:

E

5. Does the issue involve tests, experiments, or processes not described and considered in the applicable DOE-approved safety documentation?

☐ YES ☐ NO Explain:

6. Does the issue involve non-radiological hazardous materials not described and considered in the applicable DOE-approved safety documentation?

☐ YES ☐ NO Explain:

7. Could the issue affect nuclear criticality safety in a way not previously evaluated?

☐ YES ☐ NO Explain:

7.2 USQ Screen: Initiate Form

NOTE: Information entered for Steps 7.2.1 through 7.2.4 will be required to obtain the USQD Log number from the Safety Analysis Team.

Initiate FEMP USQ Screen, Form FS-F-4040 (see Figure 2) by entering the following information:

TR

7.2.1 Issue Title: Enter a brief title that identifies the issue being evaluated. Use the same title for all project documentation.

7.2.2 Facility and Location: Enter the building or facility, including the number, where the issue exists or is being proposed. Be specific, such as room numbers and column numbers where applicable.

7.2.3 Authorization Basis Documents and Reference Documents: Determine and document the authorization basis documents by the following:

A. IF the answer to either of the following is YES, **THEN** DOE-approved safety documentation is applicable.

1. Does the issue involve an activity or take place in a facility/area that is described in a DOE-approved safety document?

2. Could the issue impact an activity or facility that is described in a DOE-approved safety document?

B. IF DOE-approved documentation is applicable, **THEN** list the DOE-approved authorization documents, such as SAR, HAR, BIO, SER, ASR, OSR, and/or TSR by controlled number, revision, title and date of issuance. Identify any additional reference documents by both number and title.

C. IF the answers to both Step 7.2.3 A1 and A2 above are NO, **THEN** DOE-approved safety documentation is not applicable. Go to NS-0003 to request either a new safety assessment or a review/revision to current, FDF-approved safety documentation.

7.2.4 Briefly Describe The Issue: Obtain and present a brief description of the issue to be evaluated. Attach and reference a copy of the issue package, and references such as a proposed work plan. Present sufficient details, procedures, drawings, specifications and information required for the safety evaluation. Attach any necessary material(s).

7.2.5 USQ Determination/Safety Evaluation Log Number: Request the issuance of a USQD Log Number from the Safety Analysis Team.

7.3 Performance of USQ Screen

The following describes the procedure for performing and properly documenting the FEMP USQ Screen. The USQ Screen does not determine if a USQ exists (with one exception) for a facility/activity; it merely determines if an issue needs to be evaluated further by the USQD/SE System. The latter process then determines if the issue constitutes a USQ. The one exception, noted above, is the case of a change to a DOE-approved TSR/OSR; such a change is a USQ. Before any change to a DOE-approved TSR/OSR can be implemented, it is required to be approved by DOE.

The TR performs the USQ Screen with limited assistance from a QSE, if needed.

FORM FS-F-4040, USQ SCREEN, SHALL BE INITIATED, EITHER IN ELECTRONIC OR HARD-COPY FORMAT, TO DOCUMENT THE PERFORMANCE OF THE USQ SCREEN. ALL APPLICABLE QUESTIONS ON FORM FS-F-4040, USQ SCREEN, SHALL BE ANSWERED AND DOCUMENTED ON THE FORM, THEN A HARDCOPY SHALL BE GENERATED FOR SIGNATURES AND FILES.

TR

7.3.1 IF the issue is a discovered potential inadequacy, a potential reduction in any TSR margin of safety, or unauthorized change to a facility or activity addressed in a DOE-approved safety document, **THEN** a USQ Screen is not performed, immediately **GO TO** Step 7.1.

7.3.2 **Does this issue change, or add to, the descriptions/discussions of nearby or adjacent facilities/activities of any DOE-approved safety documentation?** (in SAR sections "Nearby Facility" or "External, Man-Made Threat" **OR** BIO section "Safety Analysis")

An example of this concern is a project which internal to itself may be no more than standard industrial, but because of its location or the location of pipelines, electrical or other support systems for it, another activity's or facility's DOE-approved safety documentation could be changed. An example would be the laying of the natural gas pipeline near the AWWT. The location of the pipeline was not described as a hazard in the DOE-approved safety documentation for the AWWT and therefore was not previously evaluated to determine if it could adversely impact the safety basis for the AWWT. A safety evaluation would need to be performed to determine the existence of a USQ for this issue.

A. IF YES is the answer to this question, **THEN** skip Step 7.3.3, question 2 on the Screen (the issue cannot be excluded), and continue the screen. **GO TO** Step 7.3.4.

B. IF NO is the answer to this question, **THEN** continue with Step 7.3.3.

7.3.3 **IF the answer to item 1 is NO, THEN is this issue Excluded from the USQD/SE System? (GO to NS-0002, Attachment A):**

To avoid overloading the USQD/SE System with issues that do not significantly affect the safety of a nonreactor nuclear facility, the second step in the USQ Screen process is to exclude trivial, inconsequential, routine or standard industrial hazards. These exclusions are listed in Attachment A and documented as item 2 on the USQ Screen, FS-F-4040.

NOTE: Exclusions do not apply to a discovered inadequacy, reduction in a TSR margin of safety, or an unauthorized change in any DOE-approved safety documentation. Such discoveries or a proposed change to a DOE-approved TSR/OSR requires a USQD safety evaluation.

A. Review and compare the descriptive documentation of the issue with the exclusions listed in Attachment A.

B. IF the issue meets all of the criteria listed for an exclusion, **THEN** mark YES on form FS-F-4040, USQ Screen, page 2, item 2, and document the content of the exclusion. Skip questions 3-7 on the form. **GO TO** Step 7.4

C. IF the issue is not excluded, **THEN** mark NO on form FS-F-4040, USQ Screen, page 2, item 2, and continue with USQ Screen process, Step 7.3.4.

7.3.4 **Does the issue involve changes to the facility description, including equipment, operations/activities, and building contents, in the applicable DOE-approved safety documentation?**

This question refers to permanent and temporary modifications on systems, structures, and components (SSC) that potentially alter the assumptions used in the safety analysis. A modification could include a change in the described drum storage configuration in a nuclear facility.

7.3.5 **Does the issue involve significant changes to the procedures described in the applicable DOE-approved safety documentation?**

Any proposed changes, beyond inconsequential (see definition 10.14), to applicable procedures must be screened for potential USQ impact.

Applicable procedures are those which are described in any applicable DOE-approved safety documents. If it can be determined that the procedures are just referenced, such as only included in a list with no discussion of the content, explain the reasoning and mark **NO**.

Inconsequential changes (see Section 10.0 for definition) such as spelling or typographical corrections, grammatical change, clarification, or additional notes or references should have been considered for exclusion during Step 7.3.3 and documented on form FS-F-4040, question 2. Ensure that the changes described here are other than inconsequential changes.

7.3.6 **Does the issue involve tests, experiments, or processes not described and considered in the applicable DOE-approved safety documentation?**

If a test, experiment, or process is being proposed that has not been previously analyzed for safety impact in the applicable DOE-approved safety documentation, mark YES as the answer to this question and continue with the Screen.

7.3.7 **Does the issue involve non-radiological hazardous materials not described and considered in the applicable DOE-approved safety documentation?**

This question concerns the introduction of new or increased amounts of non-radiological hazardous materials (see definition 10.13) such as chemical reagents, asbestos, or materials with fire or explosive potential.

7.3.8 **Could the issue affect nuclear criticality safety in a way not previously evaluated?**

If any fissile material is involved, whether it be adding a new type of material, storage of fissile material, or moving containers to a new location, the impact on nuclear criticality safety must be analyzed. Mark **YES** on the form to ensure that a safety evaluation is performed.

7.4 USQ Screen: Determination and Approval

The following information pertains to the block on page one of the USQ Screen, Form FS-F-4040 (see Figure 2), which is titled *USQ SCREEN RESULTS SUMMARY* and the signatures indicated directly below the summary block.

TR

7.4.1 Determine the USQ Screen results by performing the following:

A. IF the answers to the questions posed on page 2 of the USQ Screen form are all NO, THEN a USQD/Safety Evaluation is NOT required; a potential USQ does not exist.

B. IF YES is the answer to one or more of the questions 1, 3-7, THEN a safety evaluation is required.

C. IF question 1 is answered NO *and* question 2 is answered YES, THEN the issue is excluded from further screening and a safety evaluation is NOT required.

D. IF during the performance of the USQ Screen it becomes apparent that the issue will cause a change in an applicable TSR or DOE-approved OSR, THEN a USQ exists.

7.4.2 Mark the appropriate box(es) for the USQ Screen determination.

NOTE: An issue may impact both a TSR/OSR and other DOE-approved safety documentation, and so more than one box may be marked.

7.4.3 On the appropriate line below the summary block, print name/sign and date the USQ Screen, and obtain the applicable concurrence printed name(s), signature(s) and date(s):

A. IF issue is Excluded, THEN obtain QSE concurrence signature, and mark "not applicable" on the line for signature of Coach of SA.

B. IF issue is NOT excluded, THEN obtain concurrence signatures from the QSE and Coach of Safety Analysis.

7.4.4 IF disagreements arise from any of the concurring parties, THEN submit the disputed USQ Screen to the Coach, Safety Analysis for resolution.

7.4.5 IF any signatures were obtained prior to making a correction on the USQ Screen, THEN obtain documented acknowledgment of the change(s) from the earlier signer(s).

QSE

7.4.6 IF the USQ Screen indicates that a USQD Safety Evaluation is not required, THEN perform the following:

A. Retain the original and file as an auditable record.

B. Attach a copy to the safety documentation for the issue package.

C. Transmit a signed, hard copy of the completed USQ Screen form to the TR responsible for the issue.

D. The USQD/SE System process is completed for this issue.

QSE

7.4.7 IF the screen indicates additional evaluation is required, THEN retain the original Screen in the USQD/SE development file. It becomes a part of the USQD/SE package.

A. Attach a copy of the USQ Screen to the issue package.

B. Notify the TR responsible for the issue that no action is to be taken on the proposal until the USQD/SE is completed and resolved.

C. Continue with the USQD/SE, Section 7.5.

7.5 USQD/Safety Evaluation Process

A safety evaluation is not a substitute for a safety analysis; it merely serves as a benchmark to document if the authorization basis is being preserved. A safety analysis may show that a proposed change is safe, yet the safety evaluation may determine that this change is an Unreviewed Safety Question and hence requires DOE approval prior to implementation. The safety analysis process and the safety evaluation process, although similar in many respects, are to be treated separately.

The approved USQ Screen is an integral part of the USQD/SE package, therefore the Screen and the USQD/SE use the same USQD/SE Log number. The actual performance of the USQD safety evaluation is conducted ONLY by an assigned QSE and is documented on form FS-F-4041 (see Attachment B). Detailed guidance for the performance and documentation of a USQD/SE is provided in Safety Analysis Team procedure, SA-DPT-0003.

The safety evaluation is conducted by providing an answer to each of the seven questions identified in the interpretations provided in DOE Order 5480.21 implementation guidance. If any of these questions is answered YES, the change is considered to be an Unreviewed Safety Question. An appropriate justification for each answer, both YES and NO, is to be recorded on the USQD/SE DOCUMENTATION SHEETS (DSs) in the applicable question number block. The forms are intended to be used electronically, so that the QSE has sufficient space (a paragraph or a page) for the level of detail that is needed for the issue. This allows the determinations to be reviewed by others, now and later, with sufficient information readily available for them to see why the determination was reached.

7.6 USQD/SE: Management Review and Concurrence

7.6.1 SA Team Coach Review and Concurrence

QSE

A. Submit the USQD/SE with completed DSs to the SA Team Coach for review and concurrence. Provide a recommendation.

Coach of SA

B. Review the USQD/SE and the summary of the results and determine if sufficient safety analysis and proper documentation is included with the USQD/SE.

NOTE: A USQ situation may warrant additional safety analysis (safety assessment, ASR, etc..,) prior to submittal to the ISRC. The additional safety documentation is attached. If the USQD/SE is approved, the additional safety analysis will be included in the next applicable DOE-approved safety documentation update.

C. IF NOT in agreement with the information presented or the results, **THEN** return the package to the QSE with a documented concern, and guidance for correction and **GO TO** Step 7.6.2.

D. IF in agreement with the information and results presented, **THEN** print name, sign and date the FS-F-4041 Summary on the applicable signature line.

E. **IF** the USQD/SE determined that No USQ exists, **THEN** transmit the package to SA Team auditable records files, indicating the distribution of copies. The USQD/SE System process is complete for this issue.

F. **IF** the USQD/SE determined that a USQ does exist, **THEN** perform the following:

1. Notify the line management responsible for the issue.

2. Determine if additional safety analysis is required and notify the QSE.

3. Submit the USQD/SE package (with additional safety analysis if it was required) to the ISRC for their review and concurrence.

4. Go to Step 7.7.

7.6.2 Resolve Non-Concurrence of Coach of SA

QSE

A. **IF** the SA Team Coach is NOT in agreement with the information presented or the results of a USQD/SE and the situation can not be readily resolved, **THEN** arrange a meeting with the involved parties.

Coach of SA, QSE, TR, and Responsible Line Manager

NOTE: The TR and Responsible Line Manager are necessary to supply the additional information.

B. Discuss differences and seek a mutually acceptable resolution.

C. **IF** a mutually acceptable resolution is achieved, **THEN** the USQD/SE is adjusted as necessary, and the QSE and SA Team Coach indicate their concurrence by signing and dating in the applicable places on the Summary sheet of the USQD/SE form. Return to Step 7.6.1E.

D. **IF** a mutually acceptable resolution is NOT achieved, **THEN** the SA Team Coach makes the final determination. Return to Step 7.6.1E.

7.7 USQD/SE: ISRC Review and Recommendation

ISRC

Review the USQD/SE package and perform one of the following, per ISRC policy and procedure(s):

7.7.1 ISRC Agreement - Perform the following:

A. Mark AGREE and sign the appropriate signature line on the USQD/SE Summary & Evaluation form FS-F-4041, which indicates that the ISRC is in agreement with the information and the results as presented in this USQD/SE.

B. Notify the Coach of SA Team.

C. Transmit the USQD/SE package with the ISRC recommendation for action to the President of FDF.

7.7.2 ISRC Disagreement - Perform any one or more of the following:

A. Request that the QSE documents and presents additional information. This may be additional safety analysis.

B. Evaluate additional information (from any source) and determine if an alternate resolution for the USQD/SE is possible.

C. Request/recommend that alternative(s) to the issue or existing condition be developed and submitted.

D. Return the USQD/SE package to the QSE via the Coach of Safety Analysis for modification and mark DISAGREE on form FS-F-4041 to indicate that the ISRC does not agree with the results of the USQD/SE as written.

QSE

E. Perform the necessary actions required by the ISRC and resubmit via the Coach of SA. Repeat the process as described above until ISRC agreement is obtained.

7.8 Final Actions for Approved USQD/SE with USQ

Coach of SA

7.8.1 Notify the NS Functional Area Manager and the line manager responsible for the issue of the ISRC recommendation that the proposed change, if implemented, would constitute a USQ or that the issue (if other than proposed change) does constitute a USQ.

President of FDF

7.8.2 Approve the ISRC's recommendation and forward the USQD/SE transmittal to DOE-FEMP for concurrence; OR

7.8.3 Reject the ISRC's recommendation and return the original USQD/SE transmittal to the Coach of SA; send a copy of the transmittal to the line manager responsible for the issue with direction for action to be taken.

Responsible Line Management

7.8.4 IF USQD/SE package is transmitted to DOE, THEN do NOT implement proposed change until DOE approval has been obtained.

7.8.5 IF USQD/SE package is rejected by FDF President, THEN complete the action as directed by the President. The USQD/SE System process is complete for this issue.

8.0 RECORDS

8.1 FS-F-4040, FEMP USQ Screen

8.2 FS-F-4041, USQD/SE Summary and Evaluation

9.0 DRIVERS

9.1 DOE Order 5480.21, UNREVIEWED SAFETY QUESTIONS, December 24, 1991.

9.2 S/RID Number 9, *Nuclear and System Safety*

9.3 RM-2116, *Safety Analysis Program Requirements*

10.0 DEFINITIONS

Definitions of terms, acronyms and abbreviations used in this procedure are a subset of those listed in RM-2116, Attachment A, and only those deemed most pertinent to the performance of this procedure are repeated in this Section.

10.1 Authorization Basis: Those aspects of the facility design basis and operational requirements relied upon by DOE to authorize operation. For the purposes of this process, the authorization basis is considered to be a Safety Analysis Report (SAR), [Basis for Interim Operation (BIO)], Technical Safety Requirements (TSR), Operational Safety Requirements (OSR), [and other safety documentation] that have been approved by the DOE. (DOE Order 5480.21)

10.2 Equipment Important to Safety: Equipment important to safety is intended to include any equipment whose function can impact safety either directly or indirectly. This includes safety-related equipment, equipment relied upon for safe shutdown, and in some instances, balance-of-plant equipment. (DOE Order 5480.21)

10.3 Equivalent Component: May be identical, meet all design, seismic specifications and quality class, or have been demonstrated and documented to be equivalent to another component.

10.4 Hazard: A source of danger (i.e., material, energy source, or operation) with the potential to cause illness, injury, or death to personnel or damage to a facility or to the environment (without regard for the likelihood or credibility of accident scenarios or consequence mitigation). (DOE Order 5480.23)

10.5 Hazardous Materials: Any solid, liquid, or gaseous material that is toxic, explosive, flammable, corrosive, or otherwise physically or biologically threatening to health. Oil is excluded from this definition. (DOE Order 5480.23)

10.6 Inconsequential Change to a Procedure: A spelling or typographical correction, grammatical change, clarification, or additional note or reference. (DOE Order 5480.21)

10.7 Issue: A collective term which, in the FEMP USQD/SE System, refers to proposed changes/activities, condition, test, experiment, a discovered potential inadequacy in any DOE-approved safety documentation, a potential reduction in a TSR margin of safety, or a discovered unauthorized change to a facility or activity addressed in a DOE-approved safety document.

10.8 Margin of Safety: The margin built into the safety analyses of the facility as set forth in the authorization basis acceptance limits. (DOE Order 5480.21)

10.9 Modification - Any change or alteration to a facility/system which affects the form, fit, or function of equipment, systems, processes, or facilities, and which does not involve direct same-for-same replacement of components (or like-for-like, if substitutes were previously analyzed and approved) or routine maintenance utilizing approved procedures.

10.10 Nonreactor Nuclear Facility: A facility whose operations involve radioactive materials in such form and quantity that a significant nuclear hazard potentially exists to the employees or the general public. Included are facilities that:

(1) Produce, process, or store radioactive liquid or solid waste, fissionable materials, or tritium;

(2) Conduct separations operations;

(3) Conduct irradiated materials inspection, fuel fabrication, decontamination, or recovery operations;

(4) Conduct fuel enrichment operations; or

(5) Perform environmental remediation or waste management activities involving radioactive materials.

Incidental use of radioactive materials in a facility operation (e.g., check sources, radioactive sources, and X-ray machines) does not necessarily require the facility be included in this definition. (DOE Order 5480.23 and 5480.31)

10.11 Qualified Safety Evaluator (QSE): An individual who is qualified to prepare and/or review a USQ Screen and prepare USQD-SE by having met, at least, the minimum selection criteria and successfully completed the USQD System Safety Evaluator Training and Qualification Course. Once the training is successfully completed, the individual will be referred to as a Qualified Safety Evaluator (QSE).

10.12 Risk: The quantitative or qualitative expression of possible loss that considers both the probability that a hazard will cause harm and the consequences of that event. (DOE Order 5480.23)

10.13 Routine or Planned Maintenance Activity: Activity that does not change the normal, functional condition of the facility. Such routine or planned maintenance activities

include the refilling of the nitrogen gas bottles on the RDA system; the performance of routine PMs on equipment; the replacement of limited life-time items (filters, light fixtures, fuses, valve handles, hoses, etc.) with equivalent components; calibration; refurbishment; and housekeeping.

10.14 Safety Basis: Combination of information relating to the control of hazards at a nuclear facility (including design, engineering analyses, and administrative controls) upon which DOE depends for its conclusion that activities at the facility can be conducted safely. (DOE Order 5480.23)

10.15 Safety Evaluation: Record required to document the review of a "change". This document records the scope of the evaluation and the logic for determining whether or not an Unreviewed Safety Question exists. (DOE Order 5480.21)

10.16 Shall, Should, and May: **Shall** is used to denote a requirement; **should** is used to denote a recommendation; and **may** is used to denote permission, neither a requirement nor a recommendation. (DOE Order 5480.20)

10.17 Technically Responsible (TR) Individual: An individual who is technically responsible for the issue and performs the USQ Pre-screening and USQ Screen. The TR is trained to prepare these screenings by having successfully completed the USQ-TR Training course. The TR can be any individual who has successfully completed the USQ-TR training course within an organization that can make changes to a nuclear facility or activity at the FEMP.

10.18 Unreviewed Safety Question (USQ): A determination made by examining the following circumstances:

(1) temporary or permanent changes in the facility as described in existing safety analyses;

(2) temporary or permanent changes in the procedures as derived from existing safety analyses; and

(3) tests or experiments not described in existing safety analyses.

On identification of any of the above circumstances, an Unreviewed Safety Question [USQ] exists if one or more of the following conditions result:

(1) the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety as previously evaluated in the facility safety analyses could be increased;

(2) the possibility for an accident or malfunction of a different type than any evaluated previously in the facility safety analyses could be created; and

(3) any margin of safety as defined in the bases of the Technical Safety Requirements could be reduced. (DOE Order 5480.22)

Appendix A
USQ Screen: Exclusions

EXCLUSIONS FROM THE USQD/SE SYSTEM

To avoid overloading the USQD/SE System with issues that do not significantly affect the safety of a nonreactor nuclear facility or activity, the second step in the USQ screen process is to exclude trivial, inconsequential, routine or standard industrial hazards. Form FS-F-4040 is used to document the determination of exclusion.

NOTE: THE EXCLUSIONS LISTED IN THIS SECTION ARE FOR EXCLUSION FROM THE USQD/SE SYSTEM ONLY, NOT FROM ANY OTHER SAFETY ASSESSMENT, ANALYSIS, OR EVALUATION.

The following is the list of readily identifiable USQD/SE System exclusions, classed by the type of change:

A1. Change(s) to Procedures/Documents

NOTE: ANY PROPOSED CHANGES, BEYOND INCONSEQUENTIAL, TO PROCEDURES MUST BE SCREENED FOR POTENTIAL USQ IMPACT.

A. Procedures/documents that have only inconsequential changes, defined as (in Section 10.0) spelling or typographical correction, grammatical change, clarification, or additional note or reference.

B. Strictly administrative procedures which have no impact, directly or indirectly on the safety of personnel, facility or the public. These may include:

(1) Personnel procedures

(2) Human Resources procedures

(3) Training procedures that do not specifically qualify personnel

(4) Writers guides

(5) Internal Departmental Policies such as smoking, etc..

(6) Calibration procedures that do not change the acceptance criteria or tolerance band

(7) Preventive Maintenance procedures that do not change the configuration of the equipment or facility. These may include but are not limited to:

a. Refurbishment procedures
b. Housekeeping procedures
c. Lubrication procedures

A2. Maintenance Activities

This exclusion applies to routine maintenance activities of nuclear facilities that do not change the configuration of the facility, e.g., parts are replaced by equivalent components, or work is performed without modifying the configuration. Each organization has a procedure, work plan/order or similar documentation to initiate maintenance work. The USQD/SE System requirements need to be incorporated into the existing documentation. Examples of maintenance activities exclusions are as follows:

A. Replacement of limited lifetime items, such as, filters, light fixtures, light bulbs, fused, valve handles, hoses, etc., with equivalent components.

B. Replacement of valves, pipe, wiring, etc., with like-for-like components, as long as systems are not required to be shut down, de-energized, or disabled in order to perform the task.

A3. **Proposed Changes That Only Involve Standard Industrial Hazards (that DO NOT involve any change to a SSC or equipment important to safety as described in applicable DOE-approved safety documentation).**

Projects and facilities usually defined as "Other Industrial Hazard" for hazard classification purposes should also be considered for exclusion in the USQD/SE System (these apply ONLY to those facilities/activities where no radiological contamination is detectable).

A. Parking lots, storage yards, railroad spurs, and new roads.

B. Routine resurfacing of roads and railroad repair.

C. Re-roofing.

D. HVAC modifications not related to containment systems for hazardous material.

E. Modifications to noncritical utility systems such as:

(1) Sanitary water distribution system,
(2) Water treatment plant,
(3) Utility pole replacements,
(4) Burial of power lines,
(5) Coal and ash handling,
(6) Wells and raw water supply systems.

F. Structural, electrical, and service piping modifications (including sprinkler system modifications) in administrative buildings, such as instrument and machine shop areas that are non-process related (decontamination areas are not included).

G. Building additions and new buildings to serve administrative, non-process, or research functions.

H. Telecommunications systems.

I. Lighting systems.

J. Fencing.

K. Security equipment and facilities (covered by Security Vulnerability and Risk Assessment).

L. Metering for energy conservation and utilities monitoring.

M. Motor vehicles and heavy mobile equipment not to be used for transporting hazardous materials.

N. Standard machining tools (not involving fissile or radioactive materials) such as:

(1) Lathes,
(2) Boring mills, or
(3) N/C drills.

O. Elevator installations.

P. ADP equipment with no process control functions.

Q. Scales (with possible exceptions of those used for nuclear material withdrawal).

R. Cooling tower fan motor replacements.

S. Furnaces used to heat buildings.

T. Laboratory equipment such as:

(1) Mass spectrometers,
(2) X-ray diffraction equipment, or
(3) Mechanical test and inspection equipment.

U. Storage facilities (except those used for fissile, radioactive, or hazardous materials).

V. Environmental sampling stations.

W. Meteorological stations.

X. Screens for cooling tower basins.

Y. Instrument shop equipment.

Z. Standard sanitary landfills.

APPENDIX B
Representation of Form FS-F-4041,
USQD/SE SUMMARY & EVALUATION FORM

S

Figure 3: Representation of Form 4041 (10/20/97)

USQD/SE SUMMARY & EVALUATION FORM Log No. USQD-YR-0000

A

Charge No:	Issue (Project/Activity) Title:	
TR Printed Name:	TR Div/Dept/Sect:	TR Phone:

M

DSE Printed Name:	Div/Dept/Sect:	Badge No:
DSE Signature:	Phone:	Date:

CONCLUSIONS:

P

☐ Discovered Inadequacy ☐ Proposed Activity/Change	Does issue Address DOE-approved TSR/OSR?:	If YES, enter TSR/OSR document number:	Does issue Constitute USQ?:

SIGNATURES: (Print name/signature)

L

_____ Date: _____
Disch. Safety Analysis Team

If USQ, ISRC REVIEW RESULTS: _____AGREE or _____DISAGREE

_____ Date: _____
Independent Safety Review Committee Chair

If USQ, APPROVAL SIGNATURE:

E

President of FOF: _____ Date: _____

ISSUE DESCRIPTION:

FACILITY AND LOCATION (Give building or facility, including the number, where issue exists or proposed activities. Be as specific as possible.):
AUTHORIZATION BASIS DOCUMENTS (Cite the applicable DOE-approved safety documentation. Identify additional reference documents.):

Figure 3 (cont): Representation of Form 4041 (10/20/97)

S

BRIEF DESCRIPTION OF ISSUE (Discuss and provide a brief description of the issue to be evaluated, including any potentially affected adjacent systems or facilities. Attach and reference here the USQ Screen AND a copy of the issue package such as: proposed activity package, a deficiency report, or a document on investigation, reduction of TSR margin of safety, or unauthorized change description.)

A

M

SUMMARY OF SAFETY EVALUATION RESULTS: List in the table the responses to the USQD/Safety Evaluation.

P

L

E

Quest No.	Question	Reference (DS no.)	Response (YES/NO)
1	Could the issue increase the probability of occurrence of an accident previously evaluated in the applicable DOE-approved safety documentation?	DS-	
2	Could the issue increase the consequences of an accident previously evaluated in the applicable DOE-approved safety documentation?	DS-	
3	Could the issue increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the applicable DOE-approved safety documentation?	DS-	
4	Could the issue increase the consequences of a malfunction of equipment important to safety previously evaluated in the applicable DOE-approved safety documentation?	DS-	
5	Could the issue create the possibility of an accident of a different type than any previously evaluated in the applicable DOE-approved safety documentation?	DS-	
6	Could the issue create the possibility of a malfunction of equipment important to safety of a different type than any previously evaluated in the applicable DOE-approved safety documentation?	DS-	
7	Does the issue reduce the margin of safety as defined in the Basis for any DOE-approved TSR/OSR?	DS-	

Figure 3 (cont): Representation of Form 4041 (10/20/97)

USQD/SE DOCUMENTATION SHEET(s)

Log No: USQD-YR-0000 Page DS - 1 of 2

Complete the discussion and justification as described in NS-0002, the USQD/SE System procedure. Ensure that the justification for the response is sufficiently detailed and understandable so that others, such as members of the ISRC, could come to the same response or at least understand why you chose the response you did. This table is an electronic form and will expand to however many number of pages are needed to adequately address the required responses for each question.

Question No. & Response	USQD Questions/ Discussion & Justification
1 YES/NO	Could the issue increase the probability of occurrence of an accident previously evaluated in the applicable DOE-approved safety documentation?
2 YES/NO	Could the issue increase the consequences of an accident previously evaluated in the applicable DOE-approved safety documentation?
3 YES/NO	Could the issue increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the applicable DOE-approved safety documentation?
4 YES/NO	Could the issue increase the consequences of a malfunction of equipment important to safety previously evaluated in the applicable DOE-approved safety documentation?
5 YES/NO	Could the issue create the possibility of an accident of a different type than any previously evaluated in the applicable DOE-approved safety documentation?

Figure 3 (cont): Representation of Form 4041 (10/20/97)

Question No. & Response	USQD Questions/ Discussion & Justification
6 YES/NO	Could the issue create the possibility of a malfunction of equipment important to safety of a different type than any previously evaluated in the applicable DOE-Approved safety documentation?
7 YES/NO	Does the issue reduce the margin of safety as defined in the Basis for any DOE-approved TSR/OSR?

CONTROL NUMBER: Fe&E- 0730
SITE PROCEDURE NS-0004
REVISION NO. 1

AUDITABLE SAFETY RECORD (ASR)

NS-0004

Effective Date: 11/30/97

Originator (Subject Expert): Victoria E. Werner — 11/06/97
Victoria E. Werner, Safety Analysis Team — Date

Checker Concurrence: James W. Smith — 11/07/97
James W. Smith, Coach, Safety Analysis Team — Date

Authorized By: L. Berry for T. Renk — 11/7/97
Francis A. Renk, Nuclear and System Safety FAM — Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Fluor Daniel Fernald
P.O. Box 538704
Cincinnati, Ohio 45253-8704

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ISSUE AND REVISION SUMMARY

Revision No.	Effective Date	Description of Issue or Revision
0	6/14/96	Site procedure required to instruct personnel how to produce auditable safety records per F. Krach (WR-0260).
1	11/30/97	Editorial for organizational name changes and clarification; updating references, definitions and examples. Initiated by VE Werner

1.0 PURPOSE

This procedure establishes the process for preparing and approving an Auditable Safety Record (ASR) after performing the Auditable Safety Analysis (ASA). An ASR is the record documenting the ASA. A Request for Safety Assessment, Form FS-F-2706, documents the safety assessment which determines the level of safety analyses required for a project/facility/activity. If the safety assessment determines an ASR is required, this procedure is used to produce it. An example of a usable format is shown in Attachment 1.

2.0 SCOPE

This procedure applies to all Fernald Environmental Management Project (FEMP) personnel and subcontractors having responsibilities for initiating, supporting, preparing, approving and/or implementing an ASR.

3.0 REFERENCES

3.1 DOE 5480.23, NUCLEAR SAFETY ANALYSIS REPORT

3.2 DOE-STD-3009, *Commitments and Process Requirements*

3.3 DOE-EM-STD-5502-94, *Hazard Baseline Documentation*

3.4 RM-2116, *System Safety Requirements*

3.5 RM-0027, *Nuclear Criticality Safety Requirements*

3.6 NS-0003, *Safety Assessment Hazard Screening and Classification*

3.7 NS-0002, *Unreviewed Safety Questions (USQ) Determination and Safety Evaluation System*

4.0 RESPONSIBILITIES

4.1 Assigned Safety Analysis (SA) Lead/Analyst/Subcontractor -

4.1.1 Identifies and collects the documented input required to develop the ASR.

4.1.2 Prepares the ASR to the requirements specified by the SA Lead or SA Coach which may include:

a. A systematic identification of hazards within the applicable DOE operation

b. A description and analysis of the adequacy of measures taken to eliminate, control, or mitigate the identified hazards

c. Performing accident analyses if required

d. Developing Process Requirements, if applicable.

4.1.3 Identifies and documents in the ASR all applicable safety basis requirements (SBRs) and Process Requirements (PRs) for the subject ASR.

4.1.4 Obtains Peer and Project Engineer/Manager Review.

4.1.5 Resolves ASR review comments and with the Project Engineer/Manager determines and documents the means/method(s) for completion of the initial implementation of any identified SBRs.

4.1.6 Submits the ASR for approval to the Requesting Project Engineer/Manager and the SA Coach.

4.1.7 Submits any identified Safety Basis Requirements (SBRs) to the FEMP Commitment Tracking System (CTS) database via the applicable SA Team procedure for tracking of initial implementation.

4.1.8 After the identified SBRs have completed initial implementation, schedules the SA surveillance of implementation of these SBRs as well implementation surveillance for any identified Process Requirements.

4.1.9 When requested to do so, provides support and technical assistance to the Requesting Project Manager during ISRC and/or DOE review.

4.2 Peer Reviewer - Reviews the ASR and associated documentation for technical adequacy and certifies the acceptability of the safety analysis.

4.3 Coach of Safety Analysis -

4.3.1 Reviews and approves the ASR

4.3.2 Requests ISRC review of non-nuclear facility ASRs. (May request ISRC to review radiological facility ASRs),

4.3.3 Submits non-nuclear facilities ASRs to DOE for approval through the Requesting Project Manager

4.3.4 Controls the maintenance and retrievable storage of the approved ASR and associated documentation.

4.3.4 Controls the maintenance of the SA Surveillance Schedule for identified SBRs and PRs.

4.4 Independent Safety Review Committee (ISRC) - Reviews the ASR as requested by the Requesting Project Manager and the Coach of Safety Analysis.

4.5 Requesting Project Manager -

4.5.1 Identifies the Project Manager/Engineer/Subcontractor who will interface with the SA Lead

4.5.2 Provides the resources and expertise needed to furnish the input required for the ASR

4.5.3 Provides funds and other resources for generating an ASR

4.5.4 Reviews and approves the draft ASR, and with the SA Lead, determines the means/method(s) for completion of the initial implementation of any identified SBRs.

4.5.4 Assumes content ownership of the issued ASR.

4.5.5 Ensures implementation of all SBRs and PRs identified in the ASR.

5.0 GENERAL

NOTE: Refer to NS-0003 for the DOE/HQ Environmental Management (EM) Hazard Baseline Documentation process.

5.1 An ASA is one of the analyses that may be required as specified in NS-0003 and DOE-EM-STD-5502-94 to be provided in response to a Request for Safety Analysis Support (FS-F-2706).

5.2 ASRs are written using the graded approach. Contents of each section and guidance on the graded approach shall be obtained either in DOE-STD-3009, or, for sections not contained in DOE-STD-3009, determined jointly with the SA Coach.

5.3 This process described in this procedure is based on the DOE Limited Standard, Hazard Baseline Documentation, DOE-EM-STD-5502-94, August 1994.

5.4 An Auditable Safety Record (ASR) may be prepared for an other industrial facility, a radiological facility, or a non-nuclear facility with a "Low" hazard classification. ASRs are typically for low hazard, non-nuclear facilities. However, throughout this procedure low hazard is not used because DOE may elect to have ASRs for moderate or high hazards. An ASR may address the hazards of a non-facility (not in a building) nuclear operation, such as a storage pit environmental remediation program or the transportation of nuclear materials, as indicated in Section 8 of DOE 5480.23 and Section 4.a.(3) of Attachment 1.

5.5 Safety documentation for non-nuclear facilities must be approved by DOE. The ASRs for other industrial hazard (OIH) facilities and radiological facilities are not normally subject to DOE approval but will be submitted to DOE for information. As indicated in RM-2116, DOE-FEMP may request to approve specific ASRs.

5.6 While this procedure outlines FDF's process for generation of an ASR, it is important to note that all facilities/activities that are analyzed for safety are unique. Due to the uniqueness of each project, this procedure process does not provide specific steps of an ASR. ASRs are generated using engineering judgement and by dealing with project specific hazards that are analyzed by the System Safety Staff, under the guidance and with approval of the Requesting Project Manager and the Coach of System Safety. Flexibility/diversity are keys to writing succinct ASRs that outline and identify hazards and their controls/mitigators.

5.7 An ASR may be prepared as part of a Safety Assessment or as a separate document that references the Safety Assessment. The project analyzed in an ASA, and documented in the ASR, shall be an other industrial facility, radiological facility or a non-nuclear facility.

5.8 In the development of the Safety Assessment, per NS-0003, engineering support was required. That support shall be maintained, as assured by Project Management, during the development of the ASR as described in this document.

5.9 All safety basis requirements (SBRs) and process requirements (PRs) identified during the course of the ASA, shall be summarized and documented in the ASR under a readily identified heading.

5.10 All SBRs identified and documented in the ASR shall be entered into the FEMP CTS for tracking to completion of the initial implementation, and shall be transferred, along with any identified PRs, to the SA Surveillance Schedule when the initial implementation is completed.

5.11 The safety assessment which identifies the need for the ASA/ASR which is performed via this procedure shall be referenced in the completed ASR.

6.0 PREREQUISITES

A safety assessment performed per NS-0003 prior to or concurrent with the performance of this procedure, has identified the level of safety analysis documentation required for a project, facility, or activity to be an auditable safety record (ASR).

7.0 PROCEDURE

7.1 Auditable Safety Record Project Preparation

SA Lead/Analyst

7.1.1 Based on the results of the Safety Assessment, or to support the Safety Assessment, determine if an ASR should be used for documenting the safety basis and adequacy of the safety analysis.

7.1.2 Record the decision to use an ASR in the associated Safety Assessment.

Project Manager/Coach

7.1.3 Signify concurrence for an ASR by signing the Safety Assessment and coordinate preparation of an ASR with the assigned project SA Lead, and other required resources, such as Engineering.

SA Coach

7.1.4 Assign preparation of the ASR to assigned SA Lead or to another SA Analyst or subcontractor, if the SA Lead is not available.

SA Lead/Analyst

7.1.5 Prepare the ASR using each section identified in Table 1, at a minimum, for an other industrial facility, a radiological facility, or a non-nuclear facility.

7.1.6 As applicable, in discussion with the Project Engineer/Manager, establish commitment(s) for the project.

7.1.7 Determine if process requirements (PR) are necessary for worker health and safety. If required, develop a PR based on the recommended action for controls/mitigation from the Integrated Hazard Analysis (IHA) table.

NOTE: An example of a PR is a corrective/preventive measure as shown in Column 5 of the IHA Table provided in NS-0003, Addendum 1.

NOTE: The IHA will have been developed during the generation of the Safety Assessment per NS-0003.

7.1.8 Determine if safety basis requirements (SBRs) are applicable. If required, develop the necessary SBRs.

7.2 Auditable Safety Record Review

NOTE: Project management ensures that resources are provided, including engineering per paragraph 6.2 of this document, to support the ASR review process and maintain a record of the review.

SA Lead/Analyst

7.2.1 Route the ASR with document review sheet for review, at a minimum, to the requesting organization Project Manager and Engineer, the SA Coach, and to the assigned SA Lead, if not preformed and prepared by the Lead.

NOTE: Other reviewers may be added as necessary.

SA Coach

7.2.2 If the ASR is for a non-nuclear facility, route review copy to the above reviewers, the ISRC, and DOE after completion of the technical review.

Peer Reviewer

7.2.3 Review the ASR, document comments on attached comment sheet, and return to the assigned SA Lead/Analyst.

SA Lead/Analyst

7.2.4 Resolve and document resolution(s) to comments on the document review sheet.

7.2.5 For significant comments, obtain concurrence from the reviewer before submitting for final approval.

7.3 Auditable Safety Record Approval

SA Lead/Analyst

7.3.1 Ensure the ASR content is accurate and complete with the applicable review comments incorporated.

7.3.2 Obtain concurrence/acceptance from cognizant facility, project, or activity personnel with the contents, findings, commitments, process requirements, SBRs, and recommendations of the ASR before it is submitted for approval.

7.3.3 Obtain approval signatures on the ASR as shown in Table 2.

7.3.4 **IF** the ASR contains any SBRs, **THEN** perform the following:

A. Determine with the project management and document, the appropriate actions for completion of initial implementation and appropriate SA surveillance schedule.

B. Using the applicable section procedure, enter the SBRs into the CTS for tracking to completion.

Project Manager/Coach

7.3.5 Ensure that the ASR is completed and approved before authorizing work on any activity/project.

7.4 Auditable Safety Record Maintenance and Modification

Safety Analysis Team

7.4.1 Control and maintain all ASRs in an auditable and retrievable manner.

7.4.2 Complete assigned ASR revision preparation, review, and approval in accordance with this procedure.

7.4.3 **IF** there are proposed changes/revisions to an ASR that has DOE approval, **THEN** implement NS-0002, the USQD/SE System.

7.4.4 **IF** proposed operational/procedural changes affect ASR commitments or safety basis, **THEN** determine with the SA Coach and Project Management the appropriate graded approach for revisiting/redoing the ASR, IHA and any other appropriate analyses.

7.4.5 Document the determinations reached in Step 7.4.4.

7.4.6 Implement the appropriate procedures to attain the necessary level of analysis and revise the ASR as needed.

8.0 RECORDS

8.1 Auditable Safety Record (has SA-YR-XXXX controlled document number)

8.2 Safety Basis Requirements (are entered into the CTS with SBR preceding the requirement statement)

9.0 DRIVERS

9.1 DOE 5480.23, NUCLEAR SAFETY ANALYSIS REPORT

9.2 DOE-EM-STD-5502-94, DOE Limited Standard, *Hazard Baseline Documentation*

9.3 DOE-STD-1027-92, *Hazard Categorization and Accident Analysis Techniques for Compliance*

9.4 40 CFR 302, Table 302.4 and Appendix B to Table 302.4, *Designation, Reportable Quantities, and Notification*

9.5 EM-1 letter dated August 8, 1994, with subject: Delegation of Review and Approval Authority for Safety Documentation and for Startup/Restart for Environmental Management Field Activities

10.0 DEFINITIONS

NOTE: The following definitions are a subset of those listed in RM-2116 and are provided for emphasis.

10.1 Auditable Safety Analysis (ASA) - Similar to a SAR but with much reduced content and requirements, which provides systematic identification of hazards within a given DOE operation; and describes and analyzes the adequacy of measures taken to eliminate, control, or mitigate identified hazards. (DOE-EM-STD-5502-94) An ASR may be employed when a Safety Assessment concludes that further safety analysis is required.

10.2 Auditable Safety Record (ASR) -Documentation that contains the Auditable Safety Analysis (ASA) for radiological facilities and certain low hazard non-nuclear facilities at the FEMP to ensure that construction, operation, maintenance, shutdown, cleanup, and decommissioning activities can be safely performed in compliance with applicable laws, regulations, and requirements. An ASR may be employed when a Safety Assessment concludes that further safety analysis is required. This form of safety analysis may be either FDF or DOE-approved, depending on the facility, activity, or project described

10.3 Graded Approach -A process by which the level of analysis, documentation, and actions necessary to comply with DOE requirements are commensurate with the:

a. Relative importance to safety, safeguards, and security; and the magnitude of any hazards involved;

b. The complexity of the facility and/or systems being relied on to maintain an acceptable level or risk; and

c. Life cycle stage of the facility or activity. (DOE Order 5480.23)

10.4 Non-nuclear Facility - A facility with releasable chemical hazardous materials exceeding 40 CFR 302.4 final requirements for radiological material per 40 CFR 302.4 Or, if the facility contains releasable radiological materials that exceed 40 CFR 302.4 final requirements, and the facility contains less than nuclear Category 3 amounts per DOE-STD-1027-92, the releasable hazardous chemicals must exceed 29 CFR 1910.119 or 40 CFR 355 thresholds.

10.5 Process Requirements (PRs) - Design or operational safety requirements assigned to a project to protect the worker, that are not addressed by conventional site-wide procedures. PRs are measures taken to reduce the probability or consequences of potential hazards, or to mitigate the consequences of potential accidents. PRs are similar to TSRs but are not necessary to protect the health and safety of the public and do not require DOE approval.

10.6. Radiological Facilities - A facility that does not meet or exceed the hazard category 3 threshold values published in Table A.1 of DOE-STD-1027-92, *Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports*, but contains some quantity of radioactive material (above those discussed in Appendix B to 40 CFR 302). (DOE-EM-STD 5502-94 and DOE-STD-1027)

TABLE 1 - REQUIREMENTS FOR ASR DOCUMENTS

SUGGESTED SECTION TITLES	RADIOLOGICAL FACILITY	NON-NUCLEAR FACILITY[1]	NON-NUCLEAR FACILITY[3]
Executive Summary	O	O	R
Applicable Statutes, Rules, Regulations, and Department Orders	O	O	O
Site Characteristics	O	O	O
Facility/Project/Activity Description	M	M	M
Hazard Analysis and Hazard Classification	M	M	M
Principal Health and Safety Criteria	O	O	R
Radioactive and Hazardous Material Waste Management	O	O	R
Inadvertent Criticality Protection	M[2]	O	NA
Radiation Protection	O	O	R*
Hazardous Material Protection	O	M	M
Analysis of Normal, Abnormal, and Accident Conditions, including Design Basis Accidents, Assessment of Risks, Assessment of Contributory and Casual Events, Mechanisms and Phenomena	O	O	O
Management, Organization, and Institutional Safety Provisions	O	O	O
Procedures and Training	O	O	O
Human Factors	O	O	O
Initial Testing, Inservice Surveillance, and Maintenance	O	O	O
Process Requirements	M*	M*	M*
Commitments (SBRs)	M*	M*	M*
Operational Safety	O	R	M
Emergency Preparedness	O	O	R
Provisions for Decontamination and Decommissioning	O	O	O
Applicable Facility Design Codes and Standards	O	O	O

Legend:

M = Mandatory
O = Optional
* = if required
NA = Not Applicable
R = Recommended

Notes:

1. Non-nuclear Hazard Classification Low.
2. By definition, an ASR may only be used for facilities, projects, and activities that possess no capability for a potential criticality; therefore, justification must be presented that substantiates the improbability of a criticality.
3. Non-nuclear Hazard Classification Moderate or High. For this category, DOE acceptance of the ASR must be obtained prior to starting the process.
4. ASRs may be required for other industrial facilities that at a minimum require the same suggested section titles as radiological facilities.

TABLE 2 - ASR APPROVAL/DISTRIBUTION REQUIREMENTS

APPROVAL SIGNATURE	RADIOLOGICAL FACILITY	NON-NUCLEAR FACILITY
Requesting Organization Department/Project Manager/Coach	R	R
Coach of Safety Analysis Team	R	R
ISRC Chairperson	O[1]	R
DOE-FEMP	O[2]	R
DOE-Ohio	NA	R
Manager/Coach ORR/RA Program	D	D

Legend:
R = Approval is required
NA = Not Applicable
O = Approval is optional
D = Distribution for information

Notes:

1. ISRC review required if submitted to DOE-FEMP for approval.
2. DOE-FEMP approval is not required. However, DOE-FEMP may elect to approve the ASR.

ATTACHMENT 1:
Example ASR Format

Title

Safety Assessment XX-XXXX

Month Year

PREPARED/REVIEWED BY:

_____ Date _____
Author

_____ Date _____
Peer Reviewer

CONCURRENCE:

_____ Date _____
Requestor

APPROVALS:

_____ Date _____
James W. Smith, Safety Analysis , S&H

_____ Date _____
Project Engineer/Project Manager

Fluor Daniel Fernald
P. O. Box 538704
Cincinnati, Ohio 45253-8704

1.0 EXECUTIVE SUMMARY

Project Activity - Background - Previous Analysis
Hazard Categorization/Classification
Major Hazards
PRs/SBRs
Need for Further Analysis/Documentation

2.0 DESCRIPTION OF ACTIVITY/FACILITY/PROJECT

Activity/Facility/Project
Segmentation
Specific Exclusions

3.0 INTEGRATED HAZARD ANALYSIS (IHA)

Method of Identification of Hazards
Reference IHA Table (Appendix A)

3.1 Radiological Hazards

• • •

3.2 Chemical Hazards

• • •

3.3 Industrial Hazards

• • •

3.4 Construction Hazards

• • •

3.5 Fire/Explosion Hazards

• • •

3.6 Environmental Hazards

• • •

4.0 HAZARD CATEGORIZATION/CLASSIFICATION

Summarize the hazard category/classification and the basis for the facility/project/activity designations.

Calculations (Appendix B)

Other appendices to support the safety assessment (Appendix C..D, etc.)

5.0 PROCESS REQUIREMENTS (PRs)

• • •

6.0 SAFETY BASIS REQUIREMENTS (SBRs)

As part of SBR development, the CTS needs to be addressed.

7.0 ADDITIONAL DOCUMENT REQUIREMENTS •

Safety assessment documentation:
Hazard Analysis Report (HAR),
Safety Analysis Report (SAR),
Technical Safety Requirements (TSR),
Unreviewed Safety Question Determinaton and Safety Evaluation (USQD/SE),
Criticality Safety Approval (CSA),
Nuclear Safety Operational Authorization (NSOA),
Auditable Safety Record (ASR), and
Safety Assessment.

Project Documentation:
Project Execution Plan (PEP),
Emergency Plan (EP),
Environmental Plan,
Task Order (TO),
Health and Safety Plan (HASP),
As Low As Reasonably Achievable (ALARA)
Implementation Plan for Safety Shutdown (IP-SS),
Procedures, both site and project specific
Work Orders

References

Appendix A

IHA Table

Appendix B
Calculations

SAFETY ANALYSIS REPORTS
AND
TECHNICAL SAFETY REQUIREMENTS

NS-0005

Effective Date: 11/30/97

Originator (Subject Expert): Victoria E. Werner 11/06/97
Victoria Werner, Safety Analysis — Date

Checker Concurrence: James W. Smith 11/07/97
James W. Smith, Coach, Safety Analysis — Date

Authorized By: L. Bunk FOR T. RENK 11/7/97
Francis A. Renk, Nuclear and Systems Safety FAM — Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Fernald Environmental Restoration Management Corporation
P. O. Box 538704
Cincinnati, Ohio 45253-8704

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ISSUE AND REVISION SUMMARY

Revision	Date	Description of Issue or Revision
0	07/10/96	Procedure written to instruct site personnel how to initiate and process Safety Analysis Reports and Technical Safety Requirements according to Work Request WR-276, initiated by F. Krach.
1	11-30-97	Editorial changes to reflect organizational changes and for clarification. Initiated by VE Werner

1.0 PURPOSE

1.1 This procedure provides the steps to develop, review, approve, and issue Safety Analysis Reports (SARs), Basis of Interim Operations (BIOs), and Technical Safety Requirements (TSRs) for facilities/activities requiring SARs/TSRs, as outlined in DOE-EM-STD-5502-94, *Hazard Baseline Documentation*.

2.0 SCOPE

2.1 FDF managers, coaches, and project engineers who are responsible for facilities/operations/projects at the Fernald Environmental Management Project (FEMP) that are classified according to NS-0003 as a nuclear hazard category 2 or 3 or a non-nuclear hazard class of high, moderate, or low are required to initiate a SAR according to this procedure. FDF may request DOE approval of alternative safety basis documents for Category 3 and low hazard class facilities.

2.2 This procedure shall be used by FDF personnel involved in initiating and establishing Preliminary Safety Analysis Reports (PSARs), Final Safety Analysis Reports (FSARs), Basis of Interim Operations (BIOs), and Technical Safety Requirements (TSRs). (A TSR may be required for selected systems or controls to ensure the safety basis of a SAR/BIO).

2.3 Detailed guidance for generating a SAR is provided in DOE-STD-3009-94, *Preparation Guide for U.S. Department of Energy Non-reactor Nuclear Facility Safety Analysis Reports*. For consistency, the FEMP will use this guidance in a graded manner for all SARs–nuclear and non-nuclear–and will not repeat this information in this procedure.

2.4 Similarly, the DOE rules and guidance for TSRs outlined in DOE Order 5480.22, TECHNICAL SAFETY REQUIREMENTS, as highlighted in DOE Draft *TSR Document of Example TSRs*, November, 1993, are not repeated in this procedure, but are referred to herein as requirements.

2.5 Facilities/activities that are classified as Radiological or Other Industrial Facilities during the Safety Assessment Process are excluded from the requirements of this procedure.

3.0 REFERENCES

3.1 DOE-STD-3009-94, *Preparation Guide for U.S. Department of Energy Non-reactor Nuclear Facility Safety Analysis Reports*

3.2 DOE-STD-3011-94, *Guidance for Preparation of DOE-5480.22 and DOE-5480.23 Implementation Plans*

3.3 DOE-EM-STD-5502-94, *Hazard Baseline Documentation*

3.4 TSR Document of Example TSRs Requirements, DOE, November, 1993

3.5 RM-0027, *Nuclear Criticality Safety Requirements*

3.0 **REFERENCES** (cont.)

3.6 RM-2116, *System Safety Requirements*

3.7 NS-0002, *Unreviewed Safety Question (USQ) Determination and Safety Evaluation System*

3.8 NS-0003, *Safety Assessment Hazard Classification and Screening*

3.9 ED-12-5001, *Centralized Control of Project Documents*

4.0 RESPONSIBILITIES

NOTE: Attachment A presents a flow chart summarizing the responsibilities and flow paths among the organizations involved with developing the SARs, BIOs, and TSRs.

4.1 Requesting Project Manager/Coach - Initiator of the SAR. Ensures a SAR has been initiated according to the requirements of this procedure. Participates in the SAR/TSR Planning and review processes, including budgeting, scheduling, and other resources, as necessary. Verifies that the appropriate divisions are represented on the Integrated Hazard Analysis Team, required to generate the hazard analysis, and provides personnel to assist the team in developing the SAR/TSR as applicable. Identifies the Project Manager/Project Engineer (or designee) who will interface with Safety Analysis. Ensures that design, construction, and operating information are provided to the Safety Analysis Coach. Reviews, comments, and approves the SAR/BIO/TSR. Ensures the SAR/BIO/TSR remains current and is reviewed/updated as required.

4.2 Safety Analysis (SA) Coach - Determines with the Requesting Project Manager whether or not a request for waiver from the requirement for a Preliminary Safety Analysis Report should be requested from the DOE Assigns an SA Lead/Analyst to develop the SAR/TSR. Reviews and approves the SAR/TSR Plan. Ensures that the SAR/TSR is generated according to DOE Order 5480.23 requirements. Reviews and approves the SAR/TSR. Initiates BIOs, assigning an SA Lead/Analyst to develop/revise them. Reviews and approves BIOs.

4.3 Safety Analysis (SA) Lead/Analyst - Develops the SAR/BIO/TSR according to this procedure. Prepares the SAR/TSR Plan when required. Completes an in-depth hazard and accident analysis using an Integrated Hazard Analysis Team, as applicable, according to DOE-STD-3009-94 and as agreed to by the Safety Analysis Coach. Obtains appropriate reviews, approvals, and authorization of the SAR/BIO/TSR according to this procedure. Resolves SAR/BIO/TSR comments.

4.4 Reviewing Division/Project Manager - Ensures all division/project comments have been resolved, and approves the SAR/TSR.

4.5 Independent Safety Review Committee (ISRC) - Reviews and recommends approval of the SAR/BIO by the FDF Office of the President.

4.6 OP&I Division Leadership - Approves the SAR/BIO/TSR for the Office of President.

4.0 RESPONSIBILITIES (cont.)

4.7 Office of President - Ensures the SAR/BIO/TSR has been approved by the appropriate divisions/projects, and authorizes the SAR/BIO/TSR.

4.8 Engineering Document Control - Controls the issuance of the SAR/TSR per ED-12-5001.

5.0 GENERAL

5.1 SARs are required for facilities/activities that have the following classification according to DOE-STD-5502-94:

5.1.1 Nuclear facilities (Hazard Category 2 and 3*)

5.1.2 Non-nuclear facilities (Hazard Class High, Moderate, and Low*)

5.1.3 The Environmental Management (EM) Hazard Baseline Documentation Process is shown in RM-2116. TSRs are required only for safety class systems that ensure the safety basis of a SAR/BIO. All SAR/BIOs and TSRs are written and implemented by using a graded approach commensurate with the potential hazards.

5.2 The basis for the classification of a nuclear facility/activity is that the radiological material at risk is above the lower category 3 threshold in DOE-STD-1027-92, *Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports.* However, other analytical methodologies based on different release fractions may be used, if adequately supported and documented.

5.3 For non-reactor nuclear facilities/operations assigned a hazard category 1, 2, or 3*, the SAR is generated to meet the requirements of DOE Order 5480.23, NUCLEAR SAFETY ANALYSIS REPORTS.

5.4 For non-nuclear facilities/operations assigned to hazard classes of high, or moderate, or low* a graded SAR/BIO is also generated to meet the requirements of DOE Order 5480.23.

5.5 Non-nuclear facilities/operations that require a SAR may also require one or more TSRs as determined by management, with DOE concurrence, on a case-by-case basis. The review, approval, and issuance process for TSRs is outlined herein.

5.6 Some nuclear facilities/operations that would normally require a SAR may be covered with a Basis for Interim Operation (BIO) or Safety Document. The requirements for generating BIOs are in DOE Order 5480.23. The review, approval, and issuance process for a BIO is the same as for a SAR, as outlined herein. The FEMP's current BIOs and Safety Documents are contained in PL-3049, *Implementation Plan for Safety Analysis Reports and Technical Safety Requirements at the Fernald Environmental Management Project.*

* SARS are required, unless DOE approves an alternative safety basis document format for the Category 3 or low hazard class facility.

5.0 GENERAL (cont.)

5.7 Some facilities/projects that would normally require a SAR may be addressed in a graded SAR called a Hazard Analysis Report (HAR). A HAR focuses primarily on the facility/activity description to identify and evaluate the radiological and chemical hazards associated with a project, but it is often integrated to include OSHA-related safety concerns. As a graded SAR, a HAR incorporates programmatic controls by reference to programs discussed in existing safety basis documentation such as BIOs, Safety Documents and other safety analyses. It establishes the final categorization/classification of a facility and provides the basis for Safety Basis Requirements (SBRs) if any are identified during the hazard analysis process.

6.0 PREREQUISITES

6.1 Prior to the SAR, a Safety Assessment (hazard screening, preliminary hazard classification, and integrated hazard analysis) must be completed according to NS-0003, *Safety Assessment Hazard Classification and Screening*.

6.2 A SAR/TSR team shall be formed to include Engineering support prior to developing the SAR/TSR. The SAR/TSR team shall work together with Engineering during the development of the SAR/TSR to ensure all personnel understand the technical/engineering aspects of the project.

7.0 PROCEDURE

NOTE: The Safety Analysis Lead/Analyst has responsibility for performing hazard and safety analyses and developing the SAR/TSR with the guidance and input of the Requesting Project Manager, who is the owner of the SAR. The SA Lead/Analyst may be assisted by personnel from the requesting FEMP organization and/or by subcontractor personnel.

7.1 INITIATING A SAFETY ANALYSIS REPORT (SAR)

Requesting Project Manager/Engineer

7.1.1 When the results of a Safety Assessment are either (1) a nuclear hazard category 2 or 3 or (2) a non-nuclear hazard class of high, moderate, or low initiate the development of a graded SAR.

7.1.2 Contact the Safety Analysis Team and the Department of Energy (DOE), with the Coach of Safety Analysis, for concurrence with any plans to waive the SAR/TSR requirements for a non-facility project (an activity that does not involve a building) or to request an alternative safety basis format for Category 3 and low hazard class facilities.

NOTE: The DOE can waive the SAR requirements for a non-facility project (e.g. excavation and soil projects).

7.0 **PROCEDURE** (cont.)

7.1.3 If any of the following data has been generated or updated since the Safety Assessment, provide the Safety Analysis Team with the information:

a. Physical layout and operation of the facility

b. Description of the activity

c. Estimates of the maximum (95%), and average (50%), radiological and chemical inventories and their location

d. Number, location, names, and job classification of personnel assigned to work in the facility

e. Information on energy sources that could disperse significant amounts of radiological or other hazardous materials

f. Information on any known project hazards, including those that can endanger the workers

7.1.4 Verify with the Safety Analysis Coach that the appropriate technical disciplines are represented on the Integrated Hazard Analysis Team. If the team requires any changes, contact the applicable manager/coach.

7.1.5 Provide personnel to assist in development of the SAR and in completion of the in-depth hazard and accident analyses.

Safety Analysis Lead/Analyst

7.1.6 Provide an estimate of the budget and other resources needed to develop, issue, and maintain the SAR/TSRs.

7.2 DEVELOPING A SAR

Safety Analysis Coach

7.2.1 Assign a technical specialist to develop the SAR/BIO/HAR.

SA Lead/Analyst

7.2.2 If required by the SA Coach, write a SAR Plan (see example in Attachment B) to establish a SAR outline.

7.2.3 Distribute the SAR Plan to the SA Coach and the requesting Technical Manager/Coach for review.

7.2.4 Resolve any comments, and amend the plan accordingly.

7.0 **PROCEDURE** (cont.)

SA Coach

7.2.5 Determine if the SAR Plan is required. If a plan is needed, determine it is ready to be issued.

SA Lead/Analyst

7.2.6 As directed by the SA Coach and Requesting Project Manager/Coach, submit a copy of the SAR plan to the DOE for concurrence.

7.2.7 Complete a graded, yet in-depth, integrated hazard analysis and accident analysis, as required, according to DOE-STD-3009-94.

7.2.8 Document, review, approve, and appropriately file the in-depth, integrated hazard and accident analyses.

SA Coach and Requesting Project Manager/Coach

7.2.9 Based on the graded in-depth, integrated hazard and accident analyses, determine if the requirement for writing a Preliminary Safety Analysis Report (PSAR) should be waived according to the various aspects of the activity.

NOTE: The DOE may waive the need for a PSAR, as applicable. Typically a PSAR is required for a project to begin construction and/or purchase equipment requiring DOE approval for procurement.

SA Lead/Analyst

a. If the PSAR requirement may not be waived, develop a PSAR using the hazard analysis results, the SAR Plan, and the guidance and format given in DOE-STD-3009-94.

OR

b. If the PSAR requirement may be waived, assist the requesting organization in preparing and submitting a letter to DOE with the justification.

7.2.10 Obtain a document number for the SAR from the SA Coach.

7.2.11 If the SAR indicates one or more TSRs is required, or if a TSR is required/requested by DOE, complete the following steps:

a. Discuss a plan to generate a TSR and the tentative results with the Requesting Project Manager/Coach and the SA Coach. Obtain both manager/coaches' concurrence to generate the TSR.

b. If directed by the SA Coach, then develop a TSR according to DOE Order 5480.22 after the SAR is complete.

7.0 PROCEDURE (cont.)

7.3 REVIEWING A SAR/TSR

SA Lead/Analyst

NOTE: Required reviewers/approvers are listed in Table 1.

TABLE 1

SAR/TSR* REQUIRED APPROVALS

- Safety Analysis Team Coach
  - Designated Safety Analysis Lead
  - Nuclear Criticality Safety Lead
- Requesting Project Manager/Coach
- OP&I Division Leadership
- Other reviewing Divisions/Projects Leadership, including:
  - Engineering
  - P/QA
  - Divisions/Projects impacted by SAR/TSR
- ISRC
- Office of the President
- DOE/FEMP Site Office
- DOE Ohio Field Office

* FDF Technical Review Board has final approval authority for TSRs.

7.3.1 Route the SAR/TSR for review to a SA Peer Reviewer, the Nuclear Criticality Safety Lead, the SA Coach, Requesting Project Manager/Coach, and others, as required for the project.

7.3.2 Resolve review comments, and revise the SAR/TSR accordingly.

7.3.3 Place the permanent project file, including review comments and their resolutions, in the applicable SA Team file.

7.4 APPROVING A SAR/TSR

SA Lead/Analyst

NOTE: Table 1 shows the required reviewers.

7.4.1 When all comments have been resolved, sign (as preparer of the SAR/TSR) the approval page of the SAR/TSR.

7.0 **PROCEDURE** (cont.)

7.4.2 Prepare a Correspondence Review Sheet (known as a "Blue Sheet") according to the applicable internal procedure.

7.4.3 Obtain concurrence signatures from the SA Coach and the Requesting Project Manager/Coach on the SAR/TSR approval page and the Correspondence Review Sheet.

7.4.4 Using the Correspondence Review Sheet, route the SAR/TSR for approval to the OP&I Division Leadership and the other reviewing divisions/projects' approving authorities.

Reviewing Division/Project Leadership

7.4.5 Ensure all division/project comments have been resolved.

a. If the SAR/TSR is satisfactory, sign the Correspondence Review Sheet and the approval page of the SAR/TSR.

b. Return the SAR/TSR to the SA Lead/Analyst.

OR

c. If the SAR/TSR is not satisfactory, resolve issues with the SA Lead/Analyst.

SA Lead Analyst

7.4.6 When all approval signatures have been obtained from the reviewers in Table 1 and from the applicable divisions/projects, submit the SAR/TSR with the Correspondence Review Record Sheet through the Requesting Project Manager/Coach to the Independent Safety Review Committee (ISRC) for approval.

Independent Safety Review Committee

7.4.7 Review the SAR/TSR.

a. If the SAR/TSR is satisfactory, sign the Correspondence Review Record Sheet.

b. Return the SAR/TSR to the SA Lead/Analyst to log and forward through the Requesting Project Manager/Coach to the Office of the President.

OR

c. If the SAR/TSR is not satisfactory, resolve issues with the SA Coach and Lead/Analyst, and return the SAR to step 7.3.1.

7.0 **PROCEDURE** (cont.)

SA Lead/Analyst

7.4.8 When the ISRC chairperson has signed for the ISRC, prepare a cover letter for the FDF Office of the President requesting SAR/TSR authorization, and provide through the Requesting Project Manager/Coach a cover letter to the Office of the President to transmit the SAR/TSR to DOE.

7.4.9 Using the Correspondence Review Sheet, submit the approved SAR/TSR with both cover letters to the Office of the President.

Office of President

7.4.10 Ensure the SAR/TSR has been approved by the appropriate divisions/projects.

a. If the SAR/TSR is satisfactory, then sign and date the SAR/TSR cover page for authorization.

b. Submit the SAR/TSR to the DOE/FEMP Site Office.

AND/OR

c. If the SAR/TSR is not satisfactory to either the FDF Office of President or to the DOE, return the SAR/TSR to the SA Team Coach through the Requesting Project Manager/Coach for resolution.

SA Coach and Lead/Analyst

7.4.11 Resolve FDF Office of President and/or DOE review comments, as appropriate.

NOTE: DOE comments that are extensive as determined by the SA Coach, shall require an additional review per steps in 7.3 of this procedure.

7.4.12 After DOE comment resolution for final SAR/TSR issue, forward the SAR/TSR to S&H Document Control.

S&H Document Control

7.4.13 Log in receipt of the approved SAR/TSR and forward to Engineering Document Control for controlled distribution.

Engineering Document Control

7.4.14 Distribute the SAR/TSR as a controlled document according to ED-12-5001 and applicable internal procedures.

7.0 **PROCEDURE** (cont.)

7.5 MAINTAINING THE SAR/TSR

Requesting Project Manager/Coach

NOTE: **The DOE approval of any Unreviewed Safety Question Determination and Safety Evaluation (USQD/SE), per NS-0002 pursuant to DOE Order 5480.21, amendments to the TSRs, and material submitted by FDF to DOE in support of these approvals shall be considered an addendum to the SAR until the information is incorporated into the SAR as part of the next annual update.**

7.5.1 Annually review SARs and TSRs to ensure they are current and remain applicable.

7.5.2 Initiate an annual update by completing FS-F-2706, Request For Safety Assessment. If there are no changes for that year, state accordingly on FS-F-2706.

NOTE: SAR revisions must reflect all changes implemented up to six months prior to issuing the updated SAR. Changes not covered by USQD/SEs should also be incorporated into the SAR at the annual update.

7.5.3 If a USQD/SE has been generated per NS-0002 and approved by DOE during the year, then update the SAR/TSR to incorporate that USQD/SE.

SA Coach

7.5.4 Assign a SA Lead/Analyst to update the SAR/TSR.

SA Lead/Analyst

7.5.5 Revise the SAR/TSR as requested by the Requesting Project Manager/Coach and the SA Coach.

7.5.6 Submit the SAR/TSR for review and approval using the following guidelines:

a. If incorporating a DOE-approved USQD/SE, then obtain the approval of the Requesting Project Manager/Coach and the SA Coach only.

b. If incorporating changes that are not addressed in a DOE-approved USQD/SE, then perform the steps in Sections 7.3 and 7.4.

8.0 RECORDS

8.1 The following documents will be generated as records as a result of this procedure and will be available in the Safety Analysis Team files:

8.1.1 A controlled copy of the final SAR/TSR from Engineering Document Control.

8.1.2 Controlled forms used in the performance of this procedure

8.1.3 Calculations and analyses to support conclusions

8.2 All other records will be maintained by the requesting organizations according to their procedures.

9.0 DRIVERS

9.1 RM-0016, *FEMP Management Plan*, S/RID for Nuclear and System Safety.

9.2 DOE Order 5480.23, NUCLEAR SAFETY ANALYSIS REPORTS

9.3 DOE Order 5480.22, TECHNICAL SAFETY REQUIREMENTS

9.4 DOE Order 5480.21, UNREVIEWED SAFETY QUESTION

9.5 DOE-STD-1027-92, *Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports*

9.6 RM-2116, *System Safety Requirements*

10.0 DEFINITIONS

10.1 Basis for Interim Operation (BIO) - BIO is a documented demonstration that nuclear facility operations can be conducted at an adequate level of safety until more detailed safety documentation, fully compliant with the requirements of DOE 5480.22 and DOE 5480.23, is developed and approved by DOE. For non-reactor nuclear facilities, a BIO is required for each Hazard Category 1, 2, and 3 facility whose safety documentation does not fully comply with DOE 5480.22 or DOE 5480.23. An approved BIO serves as the interim DOE safety basis until the upgraded safety documentation is developed and approved. (DOE-STD-3011-94)

10.2 Graded Approach - A process by which the level of analysis, documentation, and actions necessary to comply with DOE requirements are commensurate with the:

10.2.1 Relative importance to safety, safeguards, and security; and the magnitude of any hazards involved.

10.2.2 The complexity of the facility and/or systems being relied on to maintain an acceptable level or risk; and

10.0 **DEFINITIONS** (cont.)

10.2.3 Life cycle stage of the facility or activity. (DOE Order 5480.23)

10.3 Hazard - A source of danger (i.e., material, energy source, or operation) with the potential to cause illness, injury, or death to personnel or damage to a facility or the environment (without regard for the likelihood or credibility of accident scenarios or consequence mitigation).

10.4 Hazard Analysis - The process to determine that material, a system, a process, and plant characteristics can produce undesirable consequences, followed by the assessment of hazardous situations associated with a process or activity. Largely qualitative techniques are used to pinpoint weaknesses in design or operation of a facility that could lead to accidents that could expose members of the public, onsite workers, facility workers, and the environment to hazardous materials. (DOE-STD-3009-94)

10.5 Hazard Analysis Report (HAR) - A graded SAR for facilities at the FEMP. It si a controlled document, requiring DOE approval, which a Safety Assessment may recommend as additional safety basis documentation for a hazardous activity. A HAR focuses primarily on the facility/activity description to identify and evaluate the radiological and chemical hazards associated with a project, but it is often integrated to include OSHA-related safety concerns. As a graded SAR, a HAR incorporates programmatic controls by reference to programs discussed in existing safety basis documentation such as BIOs, Safety Documents and other safety analyses. It will establish the final categorization/classification of a facility and provide the basis for Safety Basis Requirements (SBRs) if any are identified during the hazard analysis process.

10.6 Independent Safety Review Committee (ISRC) - An FDF committee responsible for the independent review and approval of FEMP safety analysis documentation and related documentation that establishes the safety bases for FEMP facilities, projects, and operations.

10.7 Operational Safety Requirements (OSRs) - Those requirements (previously designated as OSRs) that define the conditions, safe boundaries, and the management or administrative controls necessary to ensure the safe operation of a nuclear facility and to reduce the potential risk to the public and facility workers from uncontrolled releases of radioactive materials or from radiation exposure due to inadvertent criticality. A TSR consists of operating limits, surveillance requirements, administrative controls, use and application instructions, and the basis thereof. TSRs are to eventually replace OSRs. (DOE Order 5480.22)

10.8 Safety Analysis Report (SAR) - A report that documents the adequacy of safety analysis for a nuclear facility to ensure that the facility can be constructed, operated, maintained, shut down, and decommissioned safely and in compliance with applicable laws and regulations. (DOE Order 5480.23)

10.0 **DEFINITIONS** (cont.)

10.8.1 Preliminary SAR (PSAR) - A safety analysis document produced early in the engineering phase of a project which systematically identifies safety design criteria; analyzes potential hazards, and proposes measures to eliminate, control, or mitigate these hazards; and evaluates the potential risks. (Line management is required to obtain EM-1 or designee approval of PSARs prior to undertaking procurement of materials and components, construction, and pre-operational testing of DOE nuclear facilities, unless authorized by DOE in writing.)

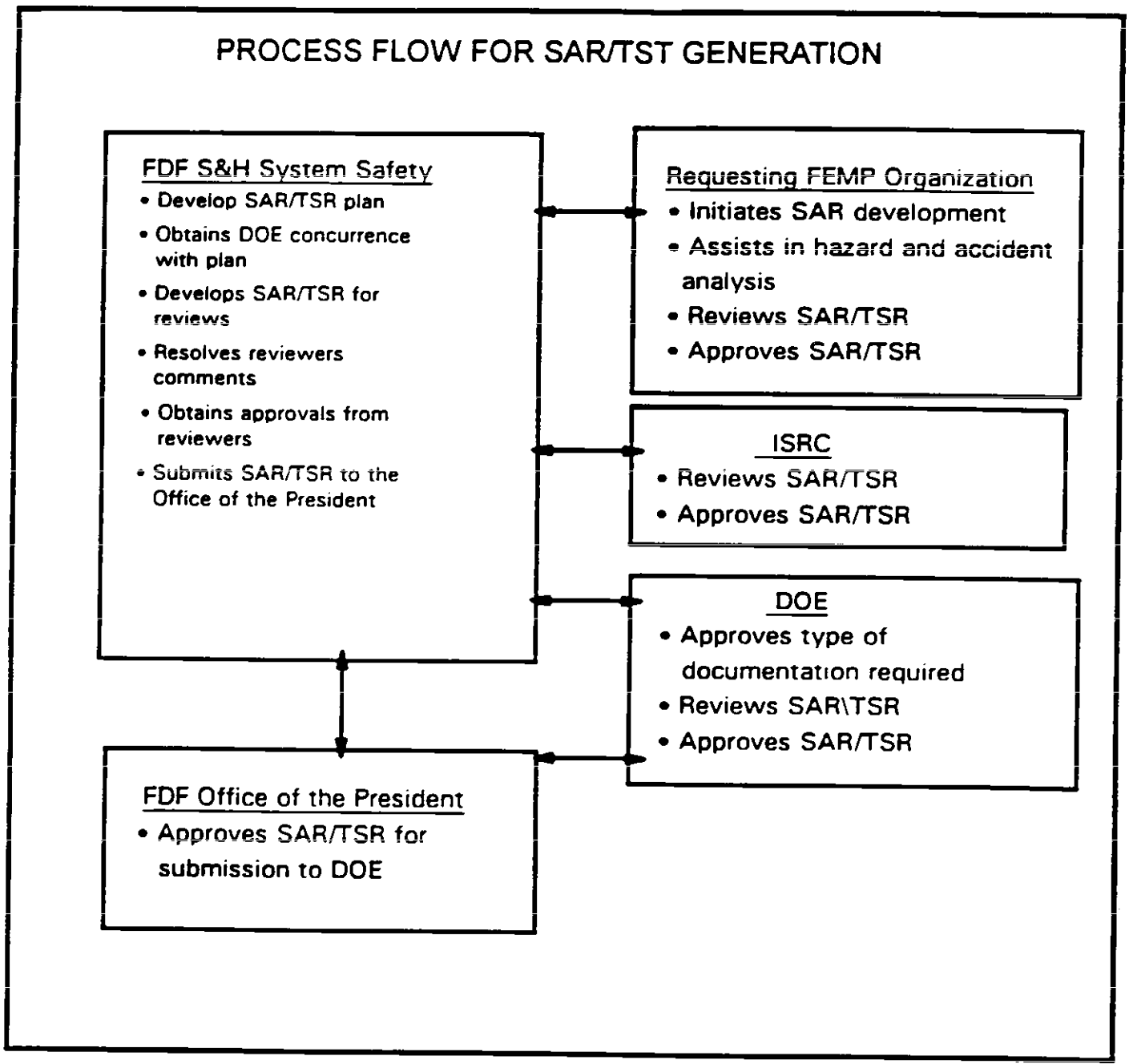
10.8.2 Final SAR (FSAR) - A safety analysis document produced after the construction of but before the operation of a facility or activity which systematically identifies hazards; describes and analyzes the adequacy of measures taken to eliminate, control, or mitigate these hazards; and analyzes and evaluates the potential accidents and associated risks. (Line management is required to obtain EM-1 or designee approval of FSARs prior to operating a DOE nuclear facility.)

10.8.3 PSAR and FSAR documents may be merged into a single FSAR or may be submitted to DOE in stages with written approval of EM-1.

10.9 Safety Basis - A combination of information relating to the control of hazards at a nuclear facility (including design, engineering analyses, and administrative controls) upon which the DOE depends for its conclusion that activities at the facility can be conducted safely. (DOE Order 5480.23)

10.10 Technical Safety Requirements (TSRs) - Those requirements (previously designated as OSRs) that define the conditions, safe boundaries, and the management or administrative controls necessary to ensure the safe operation of a nuclear facility and to reduce the potential risk to the public and facility workers from uncontrolled releases of radioactive materials or from radiation exposure due to inadvertent criticality. A TSR consists of operating limits, surveillance requirements, administrative controls, use and application instructions, and the basis thereof. TSRs are to eventually replace OSRs. (DOE Order 5480.22)

ATTACHMENT A
SAR/TSR ORGANIZATIONAL RESPONSIBILITIES FLOW CHART
PROCESS FLOW FOR SAR/TSR GENERATION



ATTACHMENT B (1 of 9)
EXAMPLE OF SAR PLAN

Safety Analysis Report Plan

UNH Neutralization Restart

January 10, 1995

Prepared by:

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Approved by:

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EXAMPLE OF SAR PLAN SHEET

1.0 Introduction

This Safety Analysis Report Plan has been developed based on the 50% UNH Neutralization Design and Preliminary Hazard Analyses of the design. The plan is subject to change as analyses are performed and verified. If any of the assumptions are proven incorrect or new hazards are discovered, the hazard category and grading philosophy will be re-evaluated and the SAR plan revised accordingly.

The radiological inventory in the scope of the Uranyl Nitrate Neutralization Project exceeds the Hazard Category 3 Threshold Quantities specified in Attachment 1 of DOE-STD-1027-92, but is well below the Hazard Category 2 Threshold Quantities.

Criticality Safety Analysis (CSA) for the design is not complete, though indications are that there is no potential for criticality as a result of processing or any credible accident scenario. The CSA depends on the results of the laboratory analysis of the UNH solutions which are in progress. When the U-235 enrichments and uranium concentrations are verified, Criticality Safety will complete the analysis. If there is a credible potential for inadvertent criticality, the Hazard Category will be incremented to Hazard Category 2 and the SAR Plan revised.

The potential for an accident resulting from incompatible materials, "Red Oil," is being investigated. All 18 UNH Storage Tanks were inspected and one, tank D1-7, has been identified to contain susceptible materials (organics and UNH solution). Project management will determine if this tank will be processed within the scope of the project.

2.0 Safety Analysis Scope

2.1 Safety Analysis Report

The Safety Analysis Report addresses the dilution, neutralization, and precipitation of the UNH Solutions currently stored in Stainless Steel tanks in and around the Plant 2/3 Refinery area. This includes the following:

- Connection of new piping system to UNH Storage Tank
- Transfer of the UNH Solutions and rinses from UNH solution storage tanks to Building 2A for dilution, neutralization, and precipitation.
- Transfer of the precipitated uranium slurry to Plant 8.
- Filtration and packaging operations in Plant 8.
- System maintenance activities after start-up.

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2.2 Technical Safety Requirements (TSR)

TSRs are not anticipated for the UNH Neutralization Restart. No Safety Class Systems have been identified during the preliminary analysis of the processing system. Safety Significant Systems or Administrative Controls, if any, will be determined from the hazard and consequence analyses and evaluated for TSR requirements.

2.3 Auditable Safety Analysis

The construction activities will be supported by auditable safety analysis. The new piping system will be constructed up to, but connecting to, the UNH Solution storage Tanks so that no inventory of nuclear materials is involved. The activities involve industrial hazards common to pipe welding and hanging.

Tank F1-26 must be prepared for processing before the Safety Analysis Report is complete. This tank will serve as one of two dilution, neutralization, and precipitation tanks and will be used for mock processing and training. It currently contains approximately 1450 gallons of UNH Solution. The inventory is well below the Category 3 Threshold Quantities in DOE-STD-1027-92. The planned activity is to transfer the contents and rinse water to an empty tank. It is an uncomplicated, less than Hazard Category 3 task requiring an auditable safety analysis.

2.4 Health and Safety Plans & Job Safety Analysis

Separate Task Specific Health and Safety Plans will be prepared for construction and operation. The Construction Health and Safety Plan is in final review and the Health and Safety Plan for operation has been drafted. Job Safety Analysis will be performed for all project procedures to better convey work hazards and safety requirements to personnel.

2.5 Safety Analysis Methodology

2.5.1 Hazard Analysis

Hazard analysis will be performed utilizing a team approach. A team has been assembled representing Fire Protection, Safety & Health, Occupational Safety & Health, Radiation Control, Safety Analysis, and Criticality Safety. The team will perform analysis of the 50% design and combined results in one Preliminary Hazard Analysis (PHA). Future hazards analysis will be performed in the same manner including other disciplines as necessary. The PHA is maintained by the Safety Analysis Department and updated as the design progresses.

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2.5.2 Hazard and Operability Analysis (HAZOP)

A HAZOP of the final design will be lead by an independent contractor with extensive HAZOP experience and included in the SAR. The HAZOP analysis will be performed by a team representing operations, project management, engineering, Safety Analysis, and occupational safety. The HAZOP is a systematic analysis of the design components to identify potential problem areas. Prior to performing the HAZOP a plan will be developed to identify the scope, purpose, and required resources.

2.6 Accident Analysis

Accidents considered to be credible range from minor spills during breakdown of pump skids and associated temporary piping to large spills from tank ruptures due to unspecified causes. The potential for common industrial accidents will be identified in the hazard analysis and addressed in the Task Specific Health & Safety Plan. A detailed accident analysis will not be performed for every accident scenario identified in the HAZOP. The consequence of a bounding spill of the total contents of the largest single tank will be quantitatively calculated by dispersion modeling and compared to the evaluation guidelines specified in Draft DOE-STD-3005, *Evaluation Guidelines for Accident Analysis and Safety Structures, Systems, and Components*, to verify the Hazard Category 3 determination. All other potential spill points in the system will be identified by the HAZOP process and addressed qualitatively since the consequence will be less than that of the bounding accident scenario. Natural Phenomena accidents will not be evaluated.

3.0 SAR Organization

The SAR contents and organization will follow draft DOE-STD-3009-93, *Preparation Guide for U. S. Department of Energy Non Reactor Nuclear Facility Safety Analysis Reports*. Table 1 indicates where 5480.23 requirements will be addressed in the SAR. Topics 8.b.(3)(b) *Applicable statutes, rules, regulations, and departmental orders*; and (u) *Applicable facility design codes and standards*, will be addressed in the individual SAR sections where they apply.

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EXAMPLE OF SAR PLAN

TABLE 1

UNH NEUTRALIZATION RESTART SAR ORGANIZATION

Topic	SAR Chapter	5480.23 Topic
Executive Summary	unnumbered	8.b.(3)(a)
Site Characteristics	1	8.b.(3)(c)
Facility Description	2	8.b.(3)(d)
Hazard and Accident Analysis	3	8.b.(3)(d),(k)
Safety Structures, Systems, & Components	4	8.b.(3)(d)
Derivation of Technical Safety Requirements	5	8.b.(3)(p)
Prevention of Inadvertent Criticality	6	8.b.(3)(h)
Radiation Protection	7	8.b.(3)(l),(k)
Hazardous Materials Protection	8	8.b.(3)(j),(k)
Radioactive and Hazardous Waste Management	9	8.b.(3)(g)
Initial Testing, In-service Surveillance, and Maintenance	10	8.b.(3)(o)
Operational Safety	11	8.b.(3)(q)
Procedures and Training	12	8.b.(3)(m)
Human Factors	13	8.b.(3)(n)
Quality Assurance	14	8.b.(3)(r)
Emergency Preparedness	15	8.b.(3)(s)
Provisions for D&D	16	8.b.(3)(t)
Management, Organization, and Institutional Safety Provisions	17	8.b.(3)(l)

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4.0 Hazard Categorization

Hazard Categorization is performed in accordance with DOE-STD-1027-92, *Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports*. The Criticality Safety Analysis and toxicological hazard categorization must be complete in order to finalize the hazard categorization.

4.1 Comparison to DOE-STD-1027-92 Threshold Quantities

The radiological inventory in the scope of the Uranyl Nitrate Neutralization Project exceeds the Hazard Category 3 Threshold Quantities specified in Attachment 1 of DOE-STD-1027-92, but is well below the Hazard Category 2 Threshold Quantities. The total inventory of UNH solutions was compared to the DOE-STD-1027-92 threshold quantities, not individual segments. Reference Attachment 1 for the radiological material inventory.

4.2 Facility Segmentation

The UNH Neutralization Project contains the following segments. None of the segments have the ability to affect co-located operations because there is either no co-located operation, or no credible accident scenario interacting with co-located operations.

4.2.1 NFS Tanks

The 4 NFS Storage Tanks (F2-605, F2-606, F2-607, & F2-608) are located outside, northeast of Building 2A which is adjacent to the Plant 1 Ore Silos, and contain approximately 46% of the UNH Solution.

4.2.2 Digestion Area, Building 2A

The 6 UNH solution Storage Tanks (D1-1, D1-7, D1-10, F1-1, F1-25, & F1-26) are located inside the Digestion area of Building 2A and contain approximately 13% of the UNH solution. UNH solution neutralization will occur in Tanks F1-25 and F1-26.

4.2.3 CD Blend Tanks

The 3 CD Blend Tanks (F2E-5, F2E-6, & F2E-8) are located outside, adjacent to the north side of Building 2A, and contain approximately 32% of the UNH solution.

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4.2.4 Hot Raffinate Area

The 4 Hot Raffinate Tanks (F1-301, F1-302, F1-303, & F1-308) are located inside Building 3E and contain approximately 3% of the UNH solution.

4.2.5 OK Liquor Storage Area

The 1 OK Liquor Tank (F3E-223) is located outside Building 2A, adjacent to the south side of Building 2A, and contains approximately 6% of the UNH solution.

4.2.6 Plant 8

Plant 8 operations include the staging of the precipitated slurry prior to filtering at the East and West EIMCO Filters. Removal and drumming of the precipitated uranium by filtration at the EIMCO Filters.

4.3 Inadvertent Criticality

Three of the UNH Storage Tanks contain material with enrichments at or above 1% U-235. Tank D1-10, located in the Digestion Area of Building 2A, contains 2,587 gallons of UNH enriched to 1.290% U-235. Tank F2-606, located in the NFS Tank area, contains 23,975 gallons of UNH enriched to 1.000% U-235. Tank F2-607, located in the NFS Tank, contains 23,975 gallons of UNH enriched to 1.000% U-235. All of this material is currently safe by enrichment, since the minimum enrichment for a UNH criticality is 2.0% U-235. Preliminary analyses indicate that there is no potential for criticality during processing or any credible accident scenario. Laboratory analysis is in progress to verify the isotopic concentrations of the UNH solutions.

4.4 Toxicological/Chemical Concerns

The only credible accident scenario identified during preliminary analysis is a spill of neutralized or un-neutralized UNH. All tanks and processing equipment are in secondary containment, confining any spill to the immediate area. Tank D1-7 may be removed from the current processing plan, removing the potential for a "Red Oil Explosion" as a result of the activities within the scope of the project. Toxicological consequences of a major spill are being evaluated to support the current Hazard Categorization. NO_x generation is minimized by the current processing plan and Industrial Hygiene will determine the requirements for NO_x protection in the work area.

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5.0 Hazard Characterization

The activity is characterized a Category 3 for the following reasons:

- Radiological inventory in excess of Category 3, but below Category 2 threshold quantities specified in DOE-STD-1027-92.
- Toxicological hazards (Nitric Acid & Caustic) qualitatively do not increase the Hazard Categorization to Category 2 because no credible accident scenario has been identified capable of dispersing the material in quantities capable of a significant on-site consequence. Consequence analysis of the worst case spill is in progress to support this conclusion.
- Credible accident scenarios within segments cannot interact with co-located operations.
- There is only a potential for minor injury to local personnel and environment with no or negligible potential for co-located operations and personnel.
- There is no potential for criticality (preliminary determination, analyses are in progress to verify that there is no potential for criticality).

6.0 Grading

The Safety Analysis Report will be graded according to guidance from DOE-STD-1027-92 and Draft DOE-STD-3009. Each of the topics listed in DOE Order 5480.23, Section 8.b.(3) will be addressed in a level of detail commensurate with the magnitude of the hazards, the complexity of the facility, and the stage of the facility life cycle as stated in the following paragraphs. The grading philosophy will emphasize worker safety, process safety, and activity isolation.

6.1 Hazard Magnitude

The hazards involved with the UNH Neutralization are generally personnel related. New piping and hardware will be installed to transfer UNH. Analysis of the storage tank integrity has indicated that there is little potential for a catastrophic failure of the tanks involved. Therefore, large releases of UNH are not anticipated. Small leaks have developed in the current piping connections and though repairs are underway, more may develop. Due to the low pH of the material personnel contamination by skin contact is the most probable and severe hazard anticipated.

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6.2 Complexity of the facility

The system has been designed in accordance with DOE Order 6430.1A to be very straight forward and efficient. Neutralization of the UNH will be accomplished with a system that has one source (UNH storage tank) and one termination (Plant 8 EIMCO Filters) utilizing new piping, pumps, and hardware. New engineered controls will be installed for process control to reduce operator exposure and prevent material release. The Plant 8 filtering operation is an established, on-going operation.

6.3 Facility Life Cycle

The UNH Storage and Processing Facilities are in the decontamination and decommissioning (D&D) Phase. The material contained in the system is being removed to facilitate the D&D of the processing equipment and storage tanks.

7.0 Safety Analysis Schedule

The SAR is a combined PSAR/FSAR, written concurrent with the project design. Because the SAR is concurrent with design, the SAR submittal date is sensitive to project delays. The SAR will have a FDF review and an Independent Safety Review before submittal to the DOE. The SAR is currently planned for submittal to DOE for review on May 24,1994.

Auditable safety analyses are completed concurrent with maintenance and construction activities and are on-going.

The HAZOP will take place after the design has been completed and approved. A What-if analysis of the 50% design submittal was performed to determine if there were any fatal flaws in the planned design. None were identified and it was determined acceptable to perform the HAZOP when the design was complete to identify and document hazards and requirements associated with operation.

Health and Safety Plans are prepared by Occupational Safety and Health. The Health and Safety Plan for Construction is in final review and the Health and Safety Plan for operations has been drafted and is on-hold pending the completion of the design.